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E. M. B.

GEORGE B. RICE, M. D.,

PRESIDENT OF THE AMERICAN HOMŒOPATHIC OPHTHALMOLOGICAL, OTOLOGICAL AND LARYNGOLOGICAL SOCIETY, 1903.

TRANSACTIONS

OF THE

American Homœopathic Ophthalmological, Otological and Laryngological Society.

SIXTEENTH ANNUAL MEETING.

BOSTON, MASS.

JUNE, 1903.

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PROCEEDINGS

—OF THE—

SIXTEENTH ANNUAL MEETING

—OF THE—

American Homœopathic Ophthalmological, Otological and Laryngological Society.

Held at Boston, Mass.,

June 20-25, 1903.

FIRST DAY—AFTERNOON SESSION.

The Sixteenth Annual Convention of the American Homœopathic Ophthalmological, Otological and Laryngological Society was opened by the President, Dr. George B. Rice, of Boston, who called the first session to order at Hotel Somerset at 2:30 P. M. of Saturday, June 20th. During this session twenty-five members were present, and the number of visitors was large.

After the President had welcomed the Society the Secretary submitted the following report:

"The evidence of interest in this Society by its members is pleasing, and the ready promises to write papers and prepare leading discussions have enabled your officers to furnish the programme for these sessions. Twenty-seven topics are to be considered, and a valuable additional feature will be the clinics planned for Tuesday afternoon, the 23d inst.

"During the year Dr. Bushrod W. James, of Philadelphia, has died, and the following members have submitted their resignations, Drs. Eliza B. Cahill, F. Park Lewis and George G. Shelton.

"I have paid out $84.45 in the subjoined amounts:

"Printing (programmes and notices)	$51.45
"Postage	18.00
"Stenographer, express, etc.	15.00
	$84.45

"J. IVIMEY DOWLING,
"Secretary Am. Hom. O., O. and L. Soc."

The Secretary's report was approved by the Society as presented.

The Treasurer being absent his report was deferred until such time as he should be present.

The President, Dr. Rice, appointed the following committees:

Committee on President's Address—Drs. Howard P. Bellows, Herbert W. Hoyt and Eugene L. Mann.

Committee on Attendance—Drs. George A. Suffa, William W. Blair and Neidhard H. Houghton.

Auditing Committee—Drs. David W. Wells, Charles H. Helfrich and Herbert D. Schenck.

The presentation of papers was next in order, and the first one read was that of Dr. Roy S. Copeland, of Ann Arbor, Mich., entitled "The Operation for Cataract." After a profitable discussion of this subject other papers were read and discussed until the adjournment at 5:45.

FIRST DAY—EVENING SESSION.

The meeting was called to order at 8:15 P. M. with Dr. Rice in the chair. Twenty members were in attendance and nine visitors availed themselves of the benefits of this session. After the reading and discussion of three papers the Society adjourned at 10 o'clock.

SECOND DAY—MORNING SESSION.

President Rice sounded the gavel promptly at ten o'clock, the election of new members was the first order of business. Dr. Irving Townsend, Chairman of the Board of Censors, submitted six applications for

membership. On motion of Dr. Charles H. Helfrich the Secretary was instructed to cast the ballot for the Society, which elected the following gentlemen to active membership in the Society: Drs. Henry H. Jewell, Nashua, New Hampshire; William Peabody Defriez, Brookline, Mass.; J. Miller Hinson, Jr., Boston, Mass.; Elmon R. Johnson, Quincy, Mass.; Grant S. Peck, Denver, Col.; Archie E. Perkins, Fitchburg, Mass.

Upon motion of Dr. Howard P. Bellows the Society extended the privilege of the floor throughout the sessions to all newly elected members and visitors.

The Secretary submitted three resignations which were accepted by vote of the Society. Those who submitted resignations are Drs. F. Park Lewis, Buffalo, New York; Eliza B. Cahill, Boston, Mass., and George G. Shelton, New York City.

The Treasurer, Dr. George W. McDowell, then read his report, which was referred to the Auditing Committee for action.

Treasurer's Report.

New York, June 19, 1903.

American Homœopathic Ophthalmological, Otological and Laryngological Society in Account with George W. McDowell, *Treasurer.*

Receipts.

Balance on hand June 15, 1902	$191.31
Dues collected	425.00
G. P. Englehard & Co.	3.00
	$619.31

Expenditures.

C. J. Swan (expenses)	$5.75
J. I. Dowling (expenses)	4.52
Stenographer's bill	100.00
C. Gurnee Fellows (expenses)	10.00
J. B. Garrison (R. R. agent)	60.00
H. D. Schenck, printing, typewriting, etc.	89.47
H. E. Francis, printing	2.25

Transactions and expressage	216.45
Treasurer's bill for stamps, etc.	11.30
	$445.74
Balance on hand	173.57
	$619.31

GEO. W. MCDOWELL, *Treasurer.*

After hearing the Treasurer's report, Dr. Rice requested First Vice-President, Roy S. Copeland, to occupy the chair while he presented his address.

The members of the Society greeted the President's address with demonstrations of approval, and on its completion the address was submitted to the committee appointed for the purpose.

Vice-President Copeland now vacated the chair in favor of the President, who then submitted for the Society's approval the question as to whether they would have a group photograph taken. The members voted affirmatively, and on motion of Dr. E. H. Linnell it was decided to appoint a committee to arrange the matter. President Rice appointed Drs. Colburn, Hooker and Bissell. Dr. Hooker declined the honor, and a committee of two was considered ample to carry out the necessary plans, which were left for the other gentlemen selected.

Before proceeding to the reading of papers Dr. Rice asked the pleasure of the Society regarding the presenting of papers in the absence of authors. On motion of Dr. Herbert D. Schenck it was decided to read such papers by title unless one or more of the leading discussors were present, and in such event they should be read in their regular order.

Papers having been presented the session was adjourned at one o'clock.

The fifth session of the Society was held in the operating theatre of the Massachusetts Homœopathic Hospital, and was called to order by President Rice at 2:30 P. M. Four surgeons operated and illustrated methods employed in the surgery of the eye, nasal accessory sinuses and mastoid involvement.

The first operation of the afternoon was performed by Dr. Elmer J. Bissell, of Rochester, N. Y., who demonstrated his modification of Mules' method of evisceration.

The patient was sent to the clinic through the courtesy of Dr. August

A. Klein, of Boston. The right eye had sustained an injury, and at the time of operating was still somewhat inflamed. While the patient was being anæsthetized Dr. Bissell spoke as follows:

"Mr. President and Fellow Members:—It is my privilege this afternoon to demonstrate my modification of Mules' method of evisceration, and I thank Dr. Rice for having extended to me this courtesy.

"This case has sustained a penetrating wound in the ciliary region of the right eye with resultant blindness, and in order to forestall a possible sympathetic inflammation of the other eye the question of enucleation or evisceration presents itself. It seems to me that the latter procedure is the indicated method in the present instance, for essentially the same good results are accomplished without the pronounced disfigurement subsequent to enucleation.

"My modification of Mules's operation consists chiefly in making a cross section of the cornea preliminary to excision of the required segment. First an initial opening is made in the conjunctiva and then it is incised throughout the corneal circumference and as close to the sclerocorneal margin as possible, then the conjunctiva is dissected back for at least one centimeter. The next step constitutes the principal modification, and with a Graefe cataract knife I puncture the sclera about six millimeters above the cornea and pass the blade through the aqueous chamber and the counter puncture is made at the same distance below the cornea, and then the cornea is bisected vertically. The cornea is then bisected horizontally, but with the difference that the initial and counter punctures are made closer to the sclera-corneal margin. Four triangular segments result which are now excised with one cut of the scissors for each segment. There now obtains an evenly curved wound shaped like a section of an orange, and which can be perfectly coapted by suturing. It is important to note that the aim is to make the vertical length of the wound from one-third to one-half greater than the horizontal width.

"Now with a good sized curette everything is removed from the scleral cavity; not a shred of anything should remain. After flushing the cavity with bichloride of mercury (1-5000), the proper sized glass sphere is introduced with the aid of the instrument devised by Mules. Only three sizes are manufactured, and the sphere to be inserted should be of such size as to permit the sclera to be closed over it without stretching. Fine white silk is used to suture the sclera, and the wound is closed in the vertical direction. The sclera must be accurately coaptated because of its low order of vitality which is unfavorable to healing. Black silk is employed in uniting the conjunctiva which should be closed

horizontally. Both eyes are covered with a light dressing, and an ice bag applied over the side operated and continued for intervals until all reaction is controlled.

"The indications for evisceration are anterior staphyloma immediately after an injury sufficient to destroy the usefulness of the eye, and when the case is seen too late for immediate action the operation may be undertaken later after all inflammatory conditions are controlled. It is especially adapted in the case of young children. Some advantages are the more extensive movement and natural appearance of the artificial eye, and also after evisceration less sinking obtains than results subsequent to enucleation. In children the orbit and surrounding tissues continue to develop more perfectly with the growth of the little patient.

"The needles to be used should be tested as carefully as is general before employing a knife in cataract extraction. I have just tested a new package of twelve needles, and out of the number there are only four sharp enough to use in suturing the sclera.

"I wish to present for your inspection this young man who was operated by Dr. Wells, according to the method under consideration. You will observe that the result is very satisfactory, and that excellent rotation of the artificial eye obtains."

Dr. Joseph C. Swan, of Chicago, Ill., was the next operator, and after a brief description of Panas's method for correcting strabismus the doctor exhibited three cases and then demonstrated the procedure by operations.

The first case was one of convergent strabismus, and the internal rectus of the left eye was the muscle operated. Dr. Swan then operated the second patient in whom the superior rectus of the right eye was operated. The third case illustrated the type of mild convergent strabismus which may occasionally be corrected by simply stretching the muscle, and in this instance the doctor first attempted to remedy the defect by simply stretching the right internal rectus, but finally decided to make the typical Panas's operation, and so followed with the regular tenotomy as in previous cases.

While operating Dr. Swan explained the technique of Panas's method, which requires central slitting of the conjunctiva over the muscle to be operated and near its insertion, then a large tenotomy hook is passed beneath the muscles and the eye rotated toward the opposite canthus with sufficient force to bury corneal margin beneath the canthus. The stretching should be continued until the muscle is thoroughly relaxed, after which it is completely severed from its insertion. A temporary paresis

results which prevents too great recession, as is likely in complete tenotomy without preliminary stretching.

Dr. Swan considers the effect of the method in question as uncertain in cases with marked deviation, and is in favor of advancing the opposing muscle.

A patient suffering with empyema of the right maxillary sinus was then presented, and Dr. A. Worrall Palmer, of New York, demonstrated the surgical procedure, after a brief preliminary description of the method to be employed.

The doctor spoke as follows: "Gentlemen: The case here presented has been diagnosed as chronic empyema of the right antrum of Highmore, and after other treatment has been unsuccessful it has been decided to resort to radical measures.

"The method I shall pursue is Desault's operation, which is to make an opening into the cavity by first dissecting through the soft tissues and then enter the antrum by chiselling through the canine fossa, which is located posterior to the canine eminence and immediately over the bicuspid teeth. This method is indicated if the teeth are sound, but in the event of decayed teeth one of them may be extracted and an entrance gained through the alveolus; the Cooper operation. Access to the sinus having been obtained it should be carefully probed in order to learn the extent of the disease, and also if any septa are present, for it must be remembered that they are sometimes present, and when found must be destroyed in order to establish the result sought.

"In this case no pus is found but probing demonstrates a soft roughened state of the lining membrane especially in the upper inner angle, in the vicinity of the ostium, indicating a polypoid degeneration, the profuse bleeding on probing is also indication of polypi. Care is necessary in curetting that the lining mucosa be as little lacerated as possible, because such injury predisposes to continuance of pus formation. After curettage, flush the antrum, cauterize with chromic acid, 50 grs. to the ounce, and pack with iodoform gauze."

Following Dr. Palmer's operation, the President, Dr. George B. Rice, of Boston, exhibited a case for diagnosis. The patient presented a picture of deep-seated, right-sided tonsillar abscess complicated with a fluctuating tumor externally and over the lower portion of the tonsillar region.

Various opinions were expressed and the diagnosis left open. Dr. Rice stated that an exploratory incision would be made and a report of the actual diagnosis published in the Transactions of the Society.

The final operation of the day was performed by Dr. George W. McDowell, of New York. The patient suffered with chronic mastoid suppuration subsequent to a like condition of the middle ear.

Dr. McDowell mentioned the indications for mastoid surgery, and alluded to the several operations employed at present by surgeons conversant with the methods devised by German aurists. The typical radical operation was the procedure employed, and performed by the doctor in his usual skillful and expeditious manner.

Through the courtesy of the superintendent of the hospital and with the assistance of the nurses and others, a collation was served to those in attendance upon the clinics. The members of the Society were also afforded an opportunity to inspect the hospital, and many availed themselves of the privilege.

In the absence of Dr. Rice, First Vice-President, Dr. Roy S. Copeland, presided and called the meeting to order at 2 P. M. Papers were read and discussed and adjournment ordered at 4 o'clock.

FOURTH DAY—WEDNESDAY, JUNE 24, 1903.

The fourth day, Wednesday, June 24th, the President called the sixth session to order at 2:30 P. M., and asked the Auditing Committee to report. The Chairman, Dr. David W. Wells, submitted the following:

"Your Committee have examined the Treasurer's account finding vouchers for every expenditure and the balance on hand is as presented in his report.

"(Signed),

DAVID W. WELLS,
CHARLES H. HELFRICH,
HERBERT D. SCHENCK,

"Auditing Committee."

During this session the Censors submitted the names of five applicants for membership. On motion of Dr. Helfrich, the Secretary, was instructed to cast the ballot electing the following doctors to active membership: Drs. Harlan T. Kerr, New York City; James D. Kennedy, West Medford, Mass.; J. W. Stitzel, Hollidaysburg, Penn.; Emily L. Hill, New York City, and Philip Rice, San Francisco, Cal.

After the reading and discussion of papers the meeting adjourned at 6 P. M.

Dr. George B. Rice opened the seventh session at 8 P. M. of Wednesday, June 24th, and immediately proceeded to the business for the evening.

The Nominating Committee submitted the following names for the pleasure of the Society in electing the officers. Dr. Roy S. Copeland moved that the Secretary cast the ballot for the Society in favor of the gentlemen whose names were presented. The motion was seconded, and as instructed the Secretary cast the ballot electing officers for the ensuing year as follows:

President—Dr. Herbert D. Schenck, Brooklyn, N. Y.

First Vice-President—Dr. Edward B. Hooker, Hartford, Conn.

Second Vice-President—Dr. David A. Strickler, Denver, Colo.

Secretary—Dr. J. Ivimey Dowling, Albany, New York.

Treasurer—Dr. George W. McDowell, New York City, N. Y.

Censors—George A. Suffa, Boston, Mass.; Dr. Joseph H. Ball, Bay City, Mich.; Dr. John M. Fawcett, Wheeling, West Virginia; Dr. George H. Rhoads, Springfield, Mass.

REPORT OF THE COMMITTEE ON THE PRESIDENT'S ADDRESS.

The Committee on President's Address reported through the Chairman, Dr. Howard P. Bellows, who spoke as follows: The very able address of our President, to which we listened with so much interest and which thrilled us with its earnestness, presents two thoughts which are predominant. One relates to the manifest duty which devolves upon us as homœopathic specialists to develop the study of Homœopathy in its relation to our specialities. He brought it succinctly to our view that we have for years been developing our minds along the pathological and surgical side of our specialties, and, by pains-taking analysis of our published Transactions, confronted us with the fact that during twelve years of our work as a Society for every nineteen pages devoted to pathology and surgery in their relation to our specialties only one page is given to Homœopathic Therapeutics. The work which we have been doing has now given us a basis and foundation for future therapeutical investigation which was indispensible. Our President urges that the time has now arrived when to these studies, which we have pursued in common with our colleagues in

the older school, we should add the study of Homœopathic Therapeutics, which is distinctively our own field of research. It is the feeling of this committee that nothing is so important at this time to the progress of this Society, and to our individual growth as members of this Society, as earnest and persistent work along these lines, developing our knowledge of drug action in special spheres and studying the application of drugs for curative effects, in strict accordance with the homœopathic law, in the practice of our several specialties. We feel that every effort should be made to bring to our meetings in future all the interest and all the information possible in purely homœopathic therapeutics, that this may be for years to come, the one great work of our Society.

The second dominant thought in our President's address relates to the importance of carrying on our Society work as largely as possible upon a clinical basis. The characteristic feature of our present meeting has been the afternoon devoted to operations in our hospital amphitheatre. The pleasure and information derived from witnessing the able operations of our colleagues from various sections of the country will long be remembered by those who were present. Your committee believes that the continuance and development of this idea in the future policy of this Society is by all means to be encouraged, and that medical as well as surgical clinics, should find a place in our meetings. The presentation of clinical matter, especially when illustrating the action of homœopathic remedies, should also be encouraged in our papers.

The closing words of our President in exalting the importance of our Society and its distinctive work, and his exhortation that nothing whatever be allowed in future to dwarf its growth or lessen its efficiency are heartily commended.

EUGENE L. MANN, M. D.,
HERBERT W. HOYT, M. D.
HOWARD P. BELLOWS, M. D.,

REPORT OF THE COMMITTEE UPON DRUG PROVING.

Dr. Bellows: On behalf of the Committee of Drug Proving which has been serving this Society for nearly three years the following report is submitted: The number of provings which have been actually completed in applying the test which this Society inaugurated is fifty-one, and two more are expected to be finished before the close of this week. This has been done in eleven different cities. In New York City five

provings have been made under the directorship of Dr. J. B. Garrison. In Brooklyn four provings under Dr. J. L. Moffat. In Chicago three under Dr. C. H. Evans, the practical work mostly devolving upon the associate director, Dr. Sam'l H. Aurand. In Philadelphia two provings have been made under Dr. Joseph C. Guernsey. In St. Louis two under Dr. P. Brickbauer. In Boston eleven under Dr. E. P. Colby. In Baltimore one under Dr. Eldridge C. Price. In Cleveland six under Dr .A. L. Waltz. In Iowa City thirteen under Dr. George Royal, and in Rochester four under Dr. E. H. Wolcott. The two additional provings which will be completed this week are being made in Detroit under the direction of Dr. R. C. Olin. Fifty-three provings at least will therefore be placed to the credit of this Society when the summary is made of the work accomplished.

The records of some of these provings have been received so recently that anything like an analysis of the result obtained can not possibly be made at this time. After many hours of study upon them it is my belief, however, that the defects exhibited in some provings are the strong points in other provings, and that when all the parts are brought together we shall have, as the resultant of the whole, a proving strong and acurate and very complete in every part but one. The instruction that all female provings should be continued over one menstrual period have unfortunately not been sufficiently heeded. There is a weakness in the record of the effects of our drug upon menstruation, therefore, and I fear several supplementary provings will be required for the correction of this defect before we are quite ready to invite public criticism of our work. For this reason I am still withholding the name of the drug which we have been testing until all our records are complete. When all is in readiness a book will be published in the name of this Society which will present in full all that has been accomplished, first with condensed detail and then with further condensation into the smallest possible working compass. This book will be illustrated with various laboratory tracings, and will place the pathogenic effects of our drug upon a basis so truly scientific that we may invite the inspection and criticism of all our colleagues of whatever name or creed. This book will be the ultimate and final report of your committee, and it is hoped that it will appear well before the expiration of the ensuing year. Should these hopes be realized this present report is the last one which will be rendered before this Society.

With the completion of this test-proving the work projected by this Society is brought to a termination. It is the work of the pioneer. Born

of our special needs we, as specialists, have inaugurated a new method of drug-proving which will give us, if pursued, a knowledge of definite drug effects, subjective and objective, which is indispensable and invaluable in our special work. It is not in the original intention, however, that we should continue to follow ourselves the course which we have endeavored to point out to others. This can now pass to the hands of avowed students of Materia Medica, who, in fact, have already done a very large share of the practical work which passes to the credit of our Society in this test proving. We must help them in all that pertains to the province of our specialty and so must other specialists—our colleagues in other branches of specialized work—but our part in the movement to reprove our whole Materia Medica ends, so far as was projected, with the completion of the inaugural test and the publication of our book.

The method which we have introduced has stood the test of fifty provings, and, with a few modifications suggested by experience, has proved itself worthy of adoption as the method of the future. The application of this method, so as to secure results in a reasonable space of time, is the next question to be solved. It has taken our Society, after every preparation was complete, one and one-half years to bring the proving of one drug by fifty provers to its present incomplete stage. It is more than our Society can do to carry this work forward with any reasonable expedition. It is more than any society of specialists can do, or the American Institute itself, without a radical change of plan, not in the method of drug proving but in the manner of obtaining results by this method. Our test proving has indicated very plainly, to my mind at least, in what direction this change of plan should be made. This question lies with the profession at large and concerns us, as specialists, only as we are an integral part of the whole profession. The discussion of the teachings of our proving in this larger sphere I have therefore undertaken before you and all our colleagues at the general session of the Institute to morrow morning. There I shall consider how each of the salient points of our new method has stood the practical test which we have imposed in our fifty provings; shall consider the comparative value of paid and volunteer provings; shall discuss the question of college provings, and shall close with a practical and definite presentation of future needs according to my personal views and experiences.

An important part of our test proving has been an effort to determine tests in determining the pathogenetic power of our drug. It was the object of these experiments to develop organic tissue changes in the

animal organism to an extent neither practicable nor safe in the human subject. This portion of the work has been most ably carried forward by Dr. Solomon C. Fuller in the laboratory of the Insane Hospital at Westoborough in this State. It was my intention to present a resume of his work in this report, but as the doctor is present with us tonight it will be better that he make his own report, particularly as it relates to certain micro-photographs which he has prepared and which he will pass among you. In closing, therefore, I move, Mr. President, that Dr. S. C. Fuller be allowed the courtesy of the floor to make a brief report in regard to his researches and the section of our forthcoming book which will be prepared by him, and of which I know we shall all be very proud.

President: In order to listen to Dr. Fuller's report it will be necessary to have some of the papers read by title. I do not doubt but that Dr. Fuller's report will be of the greatest interest; but what is your pleasure on that point?

C. G. Fellows, M. D.: I move that papers whose authors are not present be read by title.

R. S. Copeland, M. D.: I think that it will be somewhat unjust to make that rule at this time. I am very anxious to hear Dr. Fuller's report and also I want to hear the papers, and I would be willing to prolong the session sufficiently to do that. I make that as a motion.

Seconded. Carried.

President: Dr. Fuller now has the floor.

Dr. Fuller: Mr. President and Members of the Society:—

This report will be brief. A more detailed account will be given in the final statement to the director general.

For the experimental work of this proving, of which as intimated this is but a preliminary report, four dogs, four cats, two guinea pigs and two rabbits were used. The work was begun on rabbits, but for good reasons these animals were later discarded.

The photo-micrographs here presented show definite histo-pathologic changes in the tissues of the animals experimented upon, and which it is fair to suppose, were produced by administration of the θ. In the lungs, congestion, emphysema and œdema are generally found. The emphysema is oftentimes seen to be more intense in certain circumscribed areas, in which the distinction of the air vesicles produce bleb-like, or bladder formations of the lung tissue, which are elevated above the surrounding lung surface. Indeed some of these blebs are really pedunculated.

The first photo-micrograph, which is a low power magnification, is from a section made through one of the small pedunculated blebs. You will note that the peduncle here is an atelectic portion of the lung due to compression, while the air vesicles above are greatly distended, and in some instances several vesicles have ruptured to form a still larger space. In the heart, as will be seen by the photo-micrograph which I now present, the changes are those of an acute interstitial myocarditis. Between the muscle fibres will be found an infiltration of leukocytes, which is here somewhat disseminated. In other sections, however, foci of leukocytic infiltration are more or less frequent.

The three photo-micrographs of liver tissue fairly represent the histologic changes which take place in this organ. The ultimate result is a central necrosis of liver lobules. In the first picture of this series you will see that the primary changes are those of a simple cloudy swelling of the cells, in the second a marked fatty degeneration of the cells, particularly about the centre of the lobule, and in the third a complete necrosis of the centre of the lobule, the so-called *central necrosis.*

The photo-micrograph of kidney tissue, as you will observe, presents the condition of an acute parenchymatous nephritis, which needs no comment. I would add, however, that in the control animals where alcohol was administered in the same strength as found in the officinal preparation of θ, and administered in doses of equal size as those of the θ given to the experimented animals, a parenchymatous nephritis was observed, though not in so marked a degree as is represented in this typical photograph from the kidney of an animal to which the θ had been given.

In the anterior horns of the cord, as was expected, certain degenerative lesions of ganglion cells were observed. Employing Nissl's stain, these were found to be a marked chromatolysis and swelling of the root cells of the anterior horn throughout the cord, but particularly in the lumbar region, while the cordonal and commissural cells showed little or no degenerative changes.

Our studies so far have shown nothing worthy of special note in the posterior horns. The posterior root ganglia have not as yet been studied.

R. S. Copeland, M. D.: I think that Dr. Bellows, the Committee and our Society as a whole is to be congratulated for the splendid work done, and I move that a vote of thanks be extended to the Committee, and especially to its chairman, for this magnificent time-consuming piece of scientific work. Seconded. Carried.

After this report of Dr. Bellows two papers were read and dis-

cussed, and the Society adjourned. At the last session there were about forty members and visitors present. After the adjournment Dr. Hasbrouck's demonstration of an original method of massage took place.

Dr. George A. Suffa then presented the report of the Committee on Attendance, which showed that a large number of members were on hand, and also that visitors evinced considerable interest in the several sessions both by their presence and occasionally in discussion of the papers.

The Secretary read the following memorial remarks on Dr. Bushrod W. James as prepared by Dr. Thomas:

On January 6, 1903, Dr. Bushrod Washington James ended this life at his residence in Philadelphia.

The James family through which he was descended has resided in the neighborhood of Philadelphia for many generations.

The doctor's great-great-great-grandfather, David James, came from Wales, accompanying William Penn, and located in Radnor township, Montgomery county, Pa., where he purchased an extensive tract of land.

Dr. James's grandfather, Dr. Isaac James, was a well known physician of his time, and one of Dr. James's uncles, Dr. Thomas P. James, of Cambridge, Mass., was a prominent botanist and an authority on mosses. The doctor's father was also a physician and graduate of Jefferson Medical College, but after practicing old school medicine for fourteen years, espoused the cause of Homeopathy, becoming one of the pioneers of the new practice in Philadelphia.

Dr. Bushrod W. James was born in Philadelphia in 1836, where he attended the classical course of the Central High School, receiving therefrom the degree of A. M.

He was graduated from the Homeopathic Medical College of Pennsylvania in 1857.

For seven years he was attending physician to the Northern Home for Friendless Children, where an experience in an epidemic of contagious ophthalmia first excited his interest in ophthalmology.

Dr. James was always an ardent worker in medical societies, and as early as 1867 visited Paris as a National Delegate from the American Institute of Homeopathy to the French Homeopathic Medical Congress. In 1873 he was President of the Pennsylvania State Homeopathic Medical Society, and in 1883 he was President of the American Institute of Homeopathy.

For seventeen years he was surgical editor of the *American Observer* of Detroit.

He was one of the founders of the Children's Homeopathic Hospital of Philadelphia, for many years president of its medical board and had charge of the ophthalmological department. He at one time filled the chair of physiology, sanitary science and climatology in the New York Medical College for Women.

He was also a more or less active member of numerous societies of a general character, viz.: The Franklin Institute, Pennsylvania Historical Society, Academy of Natural Sciences, etc., etc,

Dr. James was a prolific writer, not only on medical topics, particularly of a historical and statistical character, but also published a number of works in general literature, notably "Alaskana; or Legends of Alaska," which passed through three editions, "Dawn of a New Era in America" and "The Political Freshman," a novel.

After having been in practice for twenty odd years, Dr. James took up the study of ophthalmology, and while never becoming an exclusivist therein, continued its practice up to the time of his last illness.

He was one of the most active and useful members of this Society, and took a most prominent part in its proceedings. In his death our membership sustains a distinct loss, as Dr. James was an indefatigable worker, always at his post, and always ready to forward the interests of the Society by any means within his power. His memory will be cherished by may of his colleagues both at home and abroad.

Before proceeding with the reading of papers is was voted to drop the session planned for Thursday afternoon, June 25th, and complete all business during the session then in progress. Remaining papers were read and discussed, and when necessary some were read by title only.

The Society adjourned sine die at 10:30 P. M., after which Dr. Sayre Hasbrouck gave a practical demonstration of the workings of his instrument for the several forms of massage.

J. IVIMEY DOWLING,
Secretary.

PRESIDENT'S ADDRESS.

BY GEORGE B. RICE,

Boston, Mass.

FELLOW members of the American Homœopathic Ophthalmological, Otological and Laryngological Society:

It should be the imperative duty of the retiring president of a society to study carefully the beginning and development of his organization from a severely critical attitude, and to point out so far as may be possible the causes of its failures and of its successes as well, and to make such comments and to give such advice as seems necessary for its future welfare.

Experience has again and again taught that the moment an organization reaches a time of full satisfaction in the work it is doing that, in that moment its progress ceases and retrogression begins with accompanying scepticism and indifference.

To say then that this organization is doing all possible to carry out the purpose for which it was formed would be short-sighted and untruthful, and so an endeavor will be made today to call to your attention what seem to be the most prominent mistakes and failures from which our society has suffered and is suffering, and to make some suggestions for your consideration concerning the best methods for correcting them.

I realize that we are all wearied with the eternal discussion of the "pathies." It would seem that we might allow this subject to rest for a time, and allow ourselves to feel the satisfaction of freedom of discuss them until they are settled, and so we must discuss this question of Homœopathy, because we claim to be homœopaths and we claim this as an homœopathic society, and we must decide as we have not yet decided, whether we shall make the study of Homœopathy a serious part of our work or not.

We must also face another problem and one quite as important. If one keeps in touch with the work of our medical societies throughout the country, it will be found that it requires an ever-increasing

amount of energy and enthusiasm on the part of their officers to prepare attractive and instructive programs, and that unless some unusual subject of a clinical nature is to be presented or a visitor is secured from afar to read a paper or to take part in a discussion that the attendance is likely to be small.

A study of the current medical literature of the day will show that, although the amount of padding and filling is perhaps quite as large, or even larger than before, yet that the amount of original work in thought in other fields; but we must face questions as they arise, and the most successful of these journals has increased more than proportionately.

Again, in the art of teaching medical science in our colleges and universities, it will be noticed that didactic work is largely being supplemented by clinical teaching, and that in some of the most advanced institutions, laboratory and clinical study occupy at least four-fifths of the time. The most popular text-books are those which contain the results of original investigation, and which give demonstrations of clinical cases.

This then is the question,—How are we to stimulate original investigation in our society, and what methods can we adopt whereby we can make the work of our society partly clinical, and thus fulfill the demands of the present age?

Still another issue has been forced upon us, namely, shall we give up our present independence and become a sickly parasite of the American Institute of Homœopathy, or shall we remain as we are a prosperous and growing organization? And here again, as an important argument, the mistake of 1886 will be noted.

With your permission we will discuss these questions in their proper order. Your present chairman is by no means the only one to consider with you the first of these questions in an annual address, and therefore from this fact it is evident that the study of Homœopathy is, and has been considered a vital part of our work.

Dr. T. P. Wilson, in his address at the meeting of the society in 1878, practically its first meeting said: "Ours is a determination to show the superiority of the homœopathic method in the departments we assume to represent. There is, I regret to say, in the minds of many an irreconciliable antagonism between pathology and homœopathic therapeutics. In answer to this I will not assume to speak for the department of general medical practice, but I do fearlessly assert that in matters pertaining to the eye and ear we have coincidently widened and perfected our therapeutics with the widening and perfection of our pathological investigations."

Dr. F. Park Lewis, in 1884, expressed himself in like manner in the following forceful phrases: "There is a work that rightly devolves upon this society which, indeed, can be performed by none other. I refer to the elaboration and perfection of the special therapeutics of the eye and ear. This territory, which from daily incursions we know to be marvelously rich and prolific, has never been accurately surveyed or as clearly defined as even our limited facilities in the way of provings will permit. We make individual investigations in this way and that, and blaze the trees that we may go and come at our own pleasure, but we have formed no exploring parties for completer survey, nor have we to any large degree aggregated or formulated the discoveries which we ourselves have made. Our recorded provings are filled with indefinite and countless ophthalmic and aural symptoms indiscriminately confused with others of positive value. Many of our drugs that we know to be of immense clinical value lack the characteristic indications that enable us to make our prescriptions with accuracy. When we have learned the exact limitations of *Gelsemium* as an eye remedy—when we know under what conditions it will control an increased intra-ocular tension—how far it is valuable in causing absorption in sub-retinal effusion, and upon what special muscles it exerts a specific effect—we will have a remedy that will rival in importance the iridectomy of Von Graefe."

Dr. A. B. Norton, in his address of 1898, spoke very strongly of the need of extending pathological investigations, with the end in view of perfecting our therapeutics and of correcting the errors and inconsistencies of our Materia Medica. To quote, he says: "Now as to the scope of our society, we believe it to be a broad one, and that is the advancement and elevation of Homœopathy in the line of our specialties. In other words, it is my desire to see homœopathic oculists, aurists and laryngologists lead the world because of their homœopathy. We believe Homœopathy to be the best method of cure in our special departments as well as in general diseases. We owe it then to ourselves as well as to humanity to demonstrate so unequivocally the superiority of our method of cure that it will be recognized as the only scientific practice."

But these gentlemen did not do more than to suggest. None of them outlined any definite plan of procedure, and therefore their remarks in this direction brought about no immediate practical results, as the following figures will show:

In the Transactions of 1878, 4 pages were devoted to Materia Medica and homœopathic therapeutics, with a total number of 73 pages.

In 1879, 10 pages, with a total number of 112 pages.
In 1880, 26 pages, with a total number of 86 pages.
In 1881, 10 pages, with a total number of 79 pages.
In 1882, 10 pages, with a total number of 89 pages.
In 1883, 16 pages, with a total number of 101 pages.
In 1884 and 1885, 5 pages, with a total number of 111 pages.
In 1897, 3 pages, with a total number of 231 pages.
In 1898, 43¼ pages, with a total number of 259 pages.
In 1899, 61¼ pages, with a total number of 313 pages.
In 1900, 4 pages, with a total number of 370 pages.
In 1901, 43¼ pages, with a total number of 333 pages.

Giving 104¼ pages devoted to the subject of Homœopathy in a total number of 1,972 pages.

Although these figures do not show exactly how much time has been devoted to homœopathic therapeutics and Materia Medica because the discussions have frequently been conducted along these lines, yet an aproximate idea can be formed, and this would be that the general trend of thoughts has been very considerably in directions quite apart from the fundamental principles upon which we are supposed to exist.

In 1900 Dr. Bellows did outline a plan for the reproving of the Materia Medica in his well-known presidential address, "The Reproving of the Materia Medica." It is a matter of familiar history that the society voted to take up this work according to these scientific methods, and that with the aid of many who do not belong to our organization the plan is now being slowly developed, as will be shown in the report which Dr. Bellows is to present to us on Wednesday evening.

An outside observer would naturally suppose that if a member, having the respect and confidence of all, was willing to devote time and money in conducting a heretofore untried but seemingly admirable and scientific method of reproving the Materia Medica for a society planned and existing for Homœopathy, that every individual member would be eager to contribute his or her share toward its development. Unfortunately the tendencies toward shirking these responsibilities, as shown by the statistics just given, were not entirely overcome, and we are still showing a half-hearted support which is quite to our shame. But the work is being accomplished in spite of the apathy of many of our members under the persistent and intelligent directions of Dr. Bellows and his aids, so that a beginning has been made and results are being obtained which show how great were our necessities.

In view of this it would seem that if in after years we who are not now doing our duty will look back to the lost opportunity with unspeakable humiliation and regret. It is predicted that this movement will be the salvation of our societies and our schools as homœopathic institutions; that it will place us in such a position that we will have the respect and gratitude of the whole medical world. Members of the American Homœopathic Ophthalmological, Otological and Laryngological Society, let us take up this task in great earnest; let us awaken a like interest in the work in other organizations, and let us show our friends of the other school that we exist for a great purpose, that of making sick people well in "a mild, prompt and durable manner" by the use of the remedy administered according to incontrovertible, scientific laws.

If by any possibility we should find that we have been chasing a "will 'o the wisp," that our supposed law of cure cannot be exposed to the light of investigation, then in throwing down the false gods we have still accomplished much toward advancing medical knowledge.

Our coming presidents should see that at all of our meetings papers are read on homœopathic therapeutics and Materia Medica, and your chairman admits his own culpability in not trying harder to bring more papers to your notice on these subjects at this session. In connection with this task we should endeavor as individual members to advance the sum total of knowledge by original investigation in the study of diseased affections. As has been said, "Pathology and homœopathic therapeutics should go hand in hand."

We are on the threshold of the pathological domain. Some one must enter and lead others. Why should not we? There are many among us who have a large mass of clinical material at their disposal, and they should not be content to treat unsuccessfully certain supposedly incurable diseases year by year simply following routine methods.

Sometime, perhaps, successful methods will be found for the cure of affections such as: Optic nerve atrophy, detached retina, complete opacity of the cornea, total blindness from glaucoma, advanced otosclerosis, affections of the labyrinth following mumps, cerebro-spinal meningitis and la grippe, the consequence of extensive middle ear suppuration, atrophic rhinitis, tuberculosis, some now incurable cases of accessory sinus disease and malignant growths. The key to these solutions may lie on the discovery and administration of the proper homœopathic remedy.

And again this work will be stimulated by the presentation and study

and discussion of clinical cases at our society meetings, and this work, as has been said, is entirely in line with advanced methods. It will make our organization vital, and cannot fail to increase individual effort in directions where now is apathy.

It may be that in the past we in doing so much work of a didactic and theoretical nature have simply been laying firmly the foundations for a more profound insight into pathological conditions which confront us when we study the patient diseased and not the disease alone.

A certain amount of preparatory work is necessary in any school of medicine, and this society is an advanced post-graduate school of medicine in the specialties. It would seem, however, that we were now ready to do more serious concerted work in the way of clinical investigation along certain lines. It is suggested for your consideration that at some time in the near future we take up some types of disease which are not as a rule amenable to successful treatment, perhaps some of those just mentioned; that we study the subjective and objective symptoms carefully as manifested by the patient, making close records of the line of treatment followed, both surgically and medicinally, giving our reasons for prescribing our remedies, noting their results, and as we meet from year to year comparing these results and thoroughly discussing the methods employed. We should by this plan more quickly arrive at conclusions, and we should have an opportunity to test the few well-proven remedies which will soon be ready for our use, thus adding by clinical evidence to the facts recorded under the provings.

It would also be wise in presenting these reports to bring before us a limited number of patients suffering from the disease under consideration. This, of course, would not be possible unless our society should make it a practice of holding its meetings in some large medical center. This scheme would not be altogether experimental with us, for on several different occasions we have tried the plan in a small way.

Among the diseases so presented may be mentioned, "Strabismus," 3 papers in the year 1899; "A Study of Lymphoid Tissue," 3 papers in the year 1900; "Heterophoria," 4 papers in the year 1900; "Aural Sclerosis," 3 papers in the year 1900; "The Influence of the Tuberculous, Scrofulous and Gouty Diathesis Upon Diseases of the Eye, Ear, Nose and Throat," 3 papers in the year 1900, and "Accessory Sinus Empyæma," 3 papers in the year 1901.

It may well be asked again, as in the case of the study of Homœpathy, why was not this scheme tried this year? Your chairman must in answer offer an apology, and reply that it was only after

extensive correspondence with the members and a careful study of the Transactions, and the seeming needs of the society that this scheme was thoroughly formulated in his mind, and that then the time had passed when it was possible to carry it out. To obviate future similar mistakes would it not be well for the incoming president to call a meeting of the past presidents and the officers of the society, and to discuss with them plans for the meeting of the next year? Is it not the fact then in all of our work we learn more from our failures than from our successes? And though it would not for a moment be hinted that the work of the past presidents has not been crowned with much success, yet every one of them can clearly see afterwards how much more could have been accomplished had their judgment been as lucid in the beginning as it was at the end of the year.

And now for the third question. We are confronted this year with a problem which in a way has been forced upon us, and yet in no official manner, to my knowledge, but a problem which must nevertheless be debated and solved before the close of this session.

Certain members of the American Institute of Homœopathy are determined that we shall join forces with them and become an Eye, Ear, Nose and Throat Bureau. In the April number of our official organ this question was considered quite exhaustively in letters from many of the former presidents of our society. It is not the intent of your present chairman to go over these arguments in detail, but simply to point out for special emphasis the most important reasons why this proposed amalgamation should not take place. As a preliminary to this, a recital of some of the fine and satisfactory things connected with our beloved organization will not be out of place.

Our society has grown in numbers from a small gathering of 40 to an organization of 162, with 1 honorary and 3 corresponding members. Our first Transactions numbered 73 pages. Our Transactions of 1902, 404 pages. Not only has the material increased in this large percentage, but the character of the papers presented has improved in like proportion.

Illustrations will be found all along the pages of our later volumes, many of them original and noteworthy. Almost every disease known to our specialties has been written about and discussed, and a perusal of these records has again and again helped us to more successfully cope with the difficult problems which daily confront us.

The Transactions show that every year an increasing number have devoted their best efforts and thought throughout long periods to the

preparation of papers for the society, and in some of these articles there will be found a veritable encyclopedia of knowledge on the subject considered.

If any of you think that our organization has not a future, let him go carefully over the Transactions from year to year, reading a paper here and there, and he will feel, he must feel, that our possibilities are so wide, so splendid, so suggestive of a great work to be accomplished, that he will be put to shame at the thought of possible failure. He will find that an increasing number of our members are year by year coming out of obscurity and showing themselves to be profound thinkers, brilliant writers, and men and women of whom any organization must be proud.

We have started a movement in the proving of drugs which it is believed will be universally adopted in years to come and will revolutionize the whole medical world. Shall we continue this task? Shall we make the future promise real, or shall we repeat the experiences of 1886, when our society was joined to the American Institute of Homœopathy, and again remain dormant and inactive for another period of years?

What are we offered by the Institute? 1st, sufficient time for our meetings. We know and have proved this year that the American Institute of Homœopathy cannot give us this time without crushing the vitality from some other organization. We are told that our Transactions will be printed and furnished to us at less cost than at present. Do we wish our papers edited by officials of the American Institute of Homœopathy, who may cut out the very articles which interest us most? Do we wish to be restricted in the minutest degree in the technical character of our papers that they be more interesting to the general practitioner?

We must, of course, if this scheme is consummated meet yearly with the Institute. The plan adopted by the Institute and urged by many influential members is that, because the most successful meetings have been those which were held in places away from the large cities, that it becomes obligatory for them to meet in the future at such places while the development and success may make it necessary that we should select large medical centers for our meetings.

Which is the greater duty, allegiance to the American Institute of Homœopathy at a great sacrifice or allegiance to the cause of medical science and to Homœopathy and its development, which will be coincident with our larger growth?

We will, of course, be willing and eager as in the past to do bureau work in our departments for the Institute, but we cannot forget how discouraging it is to spend weeks in the preparation of papers for this bureau, and then to read them before scant audiences which evince no interest in the articles and do not care to discuss them.

Just as surely as the fact that there will be a total eclipse of the sun on the 21st of next September, and that this orb will then continue its luminous course, just so surely will our society, if temporarily eclipsed by the American Institute, continue its onward course as a distinct organization perhaps with a new name. No! the work we have to do is so important that it will be carried on with ever-increasing force, and no sect, no organization, no power under the heavens, can arrest its progress.

ACUTE GLAUCOMA—CAUSES AND TREATMENT.

BY S. C. DELAP, M. D.,

Kansas City, Mo.

THE causes of acute glaucoma are legion, as assigned by the most noted writers on the subject. The mere existence of such a wide diversity of opinion is demonstrative of the fact that the real cause has not yet received the attention that its importance demands. Some claim that possibly all the causes usually enumerated operate in various cases and in various forms of the disease, but dwell upon certain ones as being chiefly causative. Some maintain that it is principally the augmentation of the secretions of the ciliary body, others contend that it is the interfernece with the secretion by way of Schlemm's canal that is at fault, whether by serosity of secretion, pressure adhesion of the periphery of the iris against the cornea, the damming up of the meshes of the pectinate ligament by pigmentary particles from the posterior surface of the iris or the ciliary body, tissue changes which hinder the escape of fluids by way of the optic nerve entrance, or closure of the lymph spaces in the region of the vorticose veins. All probably concede the fact of predisposing causes exerting some influence in producing an attack. Among these are age and the gouty diathesis, but much more doubtful are those of sex and race. Great emotion, as of joy, anxiety, grief, exposure to cold, loss of sleep are exciting causes of many general affections and certainly are responsible for precipitating attacks of ocular disease. Possibly they have a more intimate relation to the cause of glaucoma than any other affection of the eye. But it is extremely questionable whether any of these exciting causes have been the sole cause of a single attack of glaucoma.

There is little doubt but that excessive use of the eyes, especially in artificial light, is responsible for attacks of glaucoma, as it may be for a variety of other ocular affections. Excessive use of any organ renders it more susceptible to disease, and certainly an organ as finely adjusted as the eye is no exception.

When excessive use is associated with an error of refraction the strain upon the eye is very largely increased, and the tendency to ocular dis-

ease greatly augmented. The observing oculist must know that eye strain, associated with an error of refraction, is very often the cause of such diseases as phlyctenular conjunctivitis and keratitis and ulcer of the cornea. In the past this cause has not been named among the causes, while many others have been named in which a causal relation is extremely remote. This is because the relation of eye strain to ocular disease has not been given due weight as a factor in etiology. It is only within the last twenty years that persons have been fitted with glasses with the purpose of relieving eye strain, and the latter factor is a new one in etiology and certainly has not been given its proper rank in the causation of such diseases as phlyctenulæ, ulcer of the cornea and glaucoma.

Zentmayer and Posey give the following figures in regard to the refractive condition of 167 cases of acute glaucoma coming under their observation: Hyperopia, 140 eyes; myopia, 28 eyes; emmetropia, 21 eyes; astigmatism, 20 eyes. The defect in this tabulation is the omission to state the history in regard to excessive eye strain or the use of the eye in each case, especially those of emmetropia. Professor Schoen, of Leipsic, as reported in the *American Journal of Surgery and Gynæcology,* tabulates 140 cases of acute glaucoma with reference to the state of the refraction of the eye, and states that 48 per cent. had hyperopia, 33 per cent. astigmatism, and 19 per cent. other errors of refraction, and concludes that eye strain is the primary cause of acute glaucoma. Before reading this report of Professor Schoen's, in 1897, I had observed the leading factors enacted by eye strain in the production of acute glaucoma, and my treatment of these cases had been in accordance with this observation. But it was only after this publication that I was emboldened to advocate a line of treatment in harmony with such a cause.

It is not claimed that the causes enumerated in the production of glaucoma are not operative after the "vicious circle" has been established, but what it is desired to maintain is the existence of a cause that antedates the causes usually enumerated. The eye that has a disproportionally sized lens undoubtedly has a predisposition to an attack of glaucoma, but even such an eye. with a properly corrected refraction and the use of it restricted within reasonable physiological limits, is safe against an attack of glaucoma.

Before the serous exudate that results in adhesion between the periphery of the iris and the margin of the cornea there must exist a congestion of the ciliary body. The latter also antedates the swelling that

causes these bodies to project into the space of the iritic angle. Likewise there must exist a congestion antecedent to an exudate into the vitreous whereby the anterior chamber is rendered shallow and the filtration spaces blocked. The merest tryo in pathology must recognize the fact congestion must precede inflammation, and the usual sum of symptoms that generally constitute glaucoma.

It is this primary congestion of the ciliary body, before the pathological effects of glaucoma become established, or even before sufficient of them have rendered the case hopeless to any form of treatment, that must be thoroughly understood to the end that a better and more enlightened treatment may be supplied.

It is a cardinal rule of all treatment to remove the cause, if possible, before seriously considering any further treatment. When this can be done it is not generally necessary to apply further treatment. These fundamental principles of therapeutics are especially pertinent in the treatment of glaucoma. When fully comprehended and intelligently applied there will be very little use for the knife in acute glaucoma.

The exigency of practice enforced upon me the views I have just stated. There came to me cases in which there was no question but that the patient was suffering from an exaggerated eye strain with the added symptom that struck terror to my soul, an increased tension of the eye-ball. Here was an incipient case of acute glaucoma with enough of the other symptoms to render an accurate diagnosis. What could be done? My teaching was, under no circumstances of the kind, give a mydriatic; yet I know full well that nothing short of a mydriatic would relieve the spasm of the ciliary muscle. Here was the locality in which I was placed between the devil and the deep sea, and it seemed something of a frying-pan jump into the fire when I decided that it was more important to relieve the ciliary spasm than to observe the anathemas pronounced against atropine used in connection with glaucoma. In treatment I am always disposed to be conservative, always preferring milder means to harsher ones when like results can be secured. I also have a most poignant horror of doing anything that may consign a patient to the region of perpetual night. With these mental characteristics I took up the very sharp instrument, atropine, with much reluctance and many misgivings, for I had not a word from literature, nor a single injunction from my teachers to support me in what I was about to do. All were unequivocally against the means I was about to adopt. I remember well my first case of this kind some twelve years ago. It was either atropine or an iridectomy. I felt that I had no right to inflict

the mutilation that the best iridectomy entails. The increase of tension was pronounced. I therefore made a solution of one grain of atropine to twelve ounces of water. I instilled a drop into each eye and had the patient remain in my office for an hour. At the expiration of the time the pain was easier and I could not persuade myself that the tension had increased. Next day the patient was better, and I instilled another drop, and at the end of an hour of improvement I added another. Next day patient still better and I was emboldened to use a slightly stronger solution, one grain to eight ounces of water. Suffice it to say this patient got better daily, and soon got entirely well, with no recurrence in the years that have since passed.

Since it is claimed for scopolamine that it does not increase tension, I generally begin these cases with a solution of one-eightieth per cent. and gradually and cautionsly increase the strength of the solution until a one-fifth per cent. solution is used. But in my hands the effect of scopolamine is not nearly so pronounced in the relaxation of ciliary spasm as that of atropine, and the latter continues my stock solution.

I will illustrate the treatment with a case. August 20, 1902, S. B. C., of Excelsior Springs, Mo., came to me for treatment of his eyes. The trouble began four days before I saw him, late in the forenoon of that day. The pain had been so intense from three A. M. of that day that he felt obliged to walk the floor almost constantly. His vision was $^{20}/_{80}$ in each eye, and tension very decidedly increased in both eyes. He informed me that he was 38 years old, married and a butcher by occupation. No specific history could be elucidated, and I became convinced that he was telling the truth and that the condition was in accordance with his statements. The pupil was considerably dilated, with considerable injection of the conjunctiva, lachrymation, photophobia and the greatest possible ciliary pain. I began with scopolamine, one-eightieth per cent. Next day the pain was less, and I was able to make a shadow test as to the refraction. I found astigmatism present, but could not make out the degree. I found plus one and a half a diopter of hyperopia in right eye, and two diopters in left, and began the use of the galvanic current applied directly to the eye, the positive pole on the eye and the negative pole on the nape of the neck. The application of the galvanic current was continued all through the course or treatment, daily applications of 25 volts, taking about four milliamperes, five minutes at a sitting. I used the galvanic treatment, as an aid, from the fact that a short time before I had a case that nothing but this current relieved the pain, and it was this treatment that ultimately cured the

case, an operation by irridectomy being rejected. Eeven weak instillations of atropine aggravated.

On the fifth day of treatment I reached a one-fifth per cent. solution of scopolamine. This gave complete relief to the pain, and very soon the tension was reduced to normal. On the sixth day I used atropine, a drop in the eye, of a grain to the ounce solution. This aggravated and I returned to the one-fifth per cent. solution of scopolamine. On the eighth day I again used of atropine, one grain to the ounce, so as to secure more complete relief of ciliary spasm as was indicated by the shadow test. This application was now borne without aggravation, and continued daily until September 4th when I instilled a four-grain to the ounce solution for the purpose of making a final refraction of the eyes. This was well borne, and I gave him the following glasses to be worn constantly:

R+62 Ax. 90°
L+50⌒+62 Ax. 90° $^{20}/_{20}$

I saw him September 11th, and again September 24th, when I finally discharged him. He has not had any trouble since, and is pursuing his usual vocation.

He told me that he always had trouble in the use of his eyes in reading, especially in artificial light. Since using the glasses he has no trouble whatever, and I am fully satisfied that the error of refraction was the cause of the attack of glaucoma, and that the only rational cure consisted in removing the cause, as was done in this case. Had I made an irridectomy the shock of the operation acting as a counter irritant, the confinement to his room during convalescence, and the change of refraction, as a result of the operation, would also have cured him of glaucoma and possibly prevented a future attack, but I leave it to the judgment of any unprejudiced reader or listener whether the better and more rational course of treatment was not adopted. An ovarian congestion, or even inflammation, may be cured by the judicious use of the internal remedy combined with local treatment, or the surgeon may be called and castration adopted. In case either mode of treatment is curative there ought to be no hesitation as to which should be adopted. Granted that the time-honored and much lauded treatment introduced by von Graefe in 1856 is effective in curing acute glaucoma, is it not much better to remove the cause and cure the patient without the use of the knife and the necessary mutilation that follows?

In my early practice I used the knife freely with probably as good results as I have observed in most others. For nine years I have not found it necessary to operate on a single case of acute glaucoma, and I congratulate myself upon the fact that my results have been much more satisfactory to myself and to my patients.

SYMPATHETIC OPHTHALMIA; A CLINICAL CASE.

BY JAMES A. CAMPBELL, M. D.,

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SYMPATHETIC ophthalmia, following injury of one eye, while comparatively frequent, is after all a rare disease. Ohleman, as quoted by Randolph, found it only twice in 556 cases of injured eyes. I mention this as an introduction to my statement, that, while I have seen quite a number of cases of blindness, which had followed sympathetic ophthalmia under the treatment of others. I have had only one case occurring in my own practice extending back about thirty years, including the usual proportion of injuries, which would appear in over 12,000 private patients, with as many more in the hospitals and college clinics with which I have been continuously connected. I regard this not so much a tribute to personal skill as to exceptional good luck.

While a few recoveries have been reported, they are rare after the disease is well established, for under any circumstances the prognosis is always doubtful. One compiler states that after going over ophthalmological literature for the last twenty years he has been able to find only nineteen authentic cases of recovery.

I wish to briefly report my one case, which must be added to the exceptional list.

In April, 1899, a boy, six years old, was brought to me with an incised wound at the inner sclero-corneal margin of the left eye, made with a penknife, which he stuck in his eye while cutting a string. It was a clean cut, about three lines long, through which the iris protruded; a small prolapse.

The dangerous character of the injury was explained to the parents and the possibility of the involvement of the other eye was impressed upon them.

Although the injury was at the periphery of the iris, Atropiæ sulph. (gr. iv. to ℥j.) was used to secure dilitation of the pupil, for the probability of plastic adhesive inflammation was recognized. The eye was flushed with a boric acid solution and was carefully bandaged so that gentle pressure might be used to hold the eye still and favor reduction of the small prolapse. *Aconite* was given, and instructions as to diet and quiet in a darkened room enjoined.

The case was seen regularly for about two weeks. In this interval there was a rapid subsidence of the inflammation and irritation of the injured eye. The vision though diminished was about $^{15}/_{80}$. There was no pain and very little redness.

Beyond a slight sympathetic irritation the uninjured eye seemed in every way normal.

The patient was then instructed to come to my office every second day.

By the end of another week the wound was closed and the prolapse flattened down, but still adherent in line of incision. There was no pain or irritation of consequence and very little evidence of inflammation.

Although warned of the possible dangers in such a case and ordered to bring the child to me regularly for supervision, because the patient seemed to be so well, the parents presumed to follow their own judgment and I did not see the case again for about three weeks. He was then brought back again with the statement that everything seemed all right until a few days before, when the uninjured eye began to run water and be sensitive to light.

Examination showed the right eye to be involved in smypathetic inflammation. It was quite sensitive to pressure at the inner sclerocorneal region. The pupil was contracted and was very sluggish in movement; in fact, Atrophiæ sulph. (gr. viii. to ℥j.) had very little effect upon it. The iris was discolored. Plastic adhesive inflammation had set up. Plastic exudation spots could be seen on the corneal endothelium; a typical case of sympathetic plastic uveitis.

Because the injured eye still retained some vision the parents refused to consider my advice to remove it. The objection on their part may have been influenced by the fact that I would not give them a positive guarantee that its removal would save the other eye.

Atropiæ sulph. (gr. iv. to ℥j.) was used every three hours, and heat applied over the eyes both by bathing them with hot water and by means of a hot water bag. *Rhus tox.* 3d was given internally.

For about two weeks the situation had a most discouraging aspect and the usual hopeless blindness seemed to be inevitable. Then the inflammation began to subside and by degrees the irritation grew less and less, untill after about six weeks the redness, lacrymation and pain were gone, leaving, however, a badly damaged eye as a result, with vision but $^{15}/_{200}$. The injured eye was without sight.

The principle treatment during the attack was *Rhus tox.*, internally, with the continuous application of heat locally. After the inflammation was over *Aurum mur.* IX was used. As time went by there was a continuous improvement in the condition of the eye, until about one year after the original attack began he started to school wearing a 6 s. glass, which gave him V. $^{15}/_{20}$, with ability to read Jaeger No. 2.

I have purposely avoided discussion on the much disputed cause of sympathetic ophthalmia, but I desire to emphasize my belief in the value of heat in preference to cold in this complication.

OTOSCLEROSIS.

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IN every branch of the domain of medicine do we find its especial complaint beset with greater obstacles than that of the others in our efforts to combat its evil tendencies. In short, that is one encounter we dread.

In the field of the otologist otosclerosis can lay claim in every way to filling all the requirements necessary to entitle it to occupy this place in his specialty. Both on account of its insidious approach, creeping upon the individual unawares until he finds himself firmly immeshed in its clutches; as well as also for its obstinacy and pertinacity in resisting the efforts of the physician to counteract its evil influences.

Having been from its earliest discovery pronounced by our old school brethren as incurable, later followers have allowed themselves to be influenced by this decree, and I am afraid that this has also had some influence in dampening the ardor of those of our school when encountering this disease.

The symposium held by this society but a few years ago, in which many of our best minds participated, from my reading of the Transactions (as I was not a member at that time) I was struck with the seeming unanimity with which each one started off with the expressed avowal of the absolute incurability of the disease. Giving us to understand that all attempts were but a forlorn hope, in fact wasted efforts, without the slightest possibility of obtaining any beneficial results whatever.

In short, a concession of defeat at the very beginning; under which circumstances how could one ever expect to conquer?

Was ever battle won in such a way?

By otosclerosis we mean a disease consisting of a gradually increasing impairment of hearing, usually, accompanied by tinnitus of a more or less degree of severity, accompanied by frequent pains in the head and ears, besides as a rule a completely patulous condition of the Eustachian tubes.

A most prominent symptom of this complaint also being Paracussis Willisi, or the ability of hearing better in a noise.

In its uncomplicated forms on examination all physical signs in the ears are usually entirely wanting.

By functional tests we find a diminished ratio of air to bone conduction, with the latter often in excess. The perception for low notes by air conduction being lost, while by bone conduction very much augmented.

By Galton's test, although early in the disease is not affected, later on is markedly lessened. Besides by the continuous tone series, gaps are very apt to be found in the scale.

Some of our enthusiastic German pathologists desiring to provide us with an etiology for this disease have characterized it as a tropho-neurosis. A high sounding title, and no doubt most awe-inspiring to those of the laity of an inquiring turn of mind, as sufficiently portentous to silence all further questioning on their part. But to the physician, however, a term most indefinite and partaking of about as great a significance as the ancient but thoroughly respectable etiological factor "biliousness." By this term tropho-neurosis, we understand any functional nervous disease due to a failure of nutrition from defective nerve influence.

Without doubt this condition exists here, but simply knowing the fact of possession does not lead us one step nearer as to its real etiology —its specific cause.

A theory of comparatively recent date as to the etiology of otosclerosis has been advanced, and which is gaining ground among the believers of which as to its validity the writer classes himself is that this disease is one form of a manifestation of a fault in the metabolistic function in which the excretory elements of nutrition are not properly eliminated. In other words, the result of an uric acid toxæmia due to the retention of this product in the system. A veritable toxæmia in all senses of the word, attacking the individual in his most vulnerable point—the labyrinth.

The somewhat old theory of its gouty origin, attributed to the fact that in the urine of these patients urates are found in abundance, has been a foreshadow of this theory of uric acid causation. Besides as usually these individuals are more or less in an anæmic condition with a nervous system at an exceedingly low ebb, the same manifestations are usually an accompaniment of the uric acid diathesis; as also a well known fact that the so-called gouty diathesis is ever a predisposing factor in ear diseases.

Inasmuch as the old gouty theory being now understood as synonymous, although but rudimentary at the time of its inception with the present theory of the uric acid diathesis, the rationale of the latter as a causative factor in disease applies also to the ear as well as in all other parts of the body. The strongest point, however, which gives color to the probability of uric acid being an etiological factor in this condition has been the fact demonstrated by experience that as a rule these otosclerotic patients present the characteristics and symptoms of individuals of this class or diathesis as above described.

In short, the writer claims that in this condition of the ear-otosclerosis—uric acid retained in the system is the primary causative factor—occurring as such in an individual with a labyrinth susceptible to the action of this agent, either through congenital or inherited means; in which case we would expect to find the uncomplicated form present, i. e., unaccompanied by any middle ear lesion and presenting no visible signs of its existence on examination; or else the acquired form, the result of various causes, especially that of a middle ear disease, notably the adhesive or non-exudative form.

Descriptions of this disease we have received from as early as Toynbee, in 1837; later by Moos, Katz, Haberman, Hartmann, Siebenmann and last, but by no means least, the illustrious Politzer.

The latter fully demonstrated this condition post-mortem on cases which presented the characteristic symptoms of the disease during the lifetime of the individuals. Therefore of inestimable value in enlightening us as to the existing pathological condition in this disease.

According to the findings of Politzer the diseased process which we are to infer as present in otosclerosis, proper and uncomplicated—not accompanied by any tympanic involvement—is confined entirely within the labyrinthine capsule. As to its structure it consists of a new formation of osseous tissue and invariably occurs in the region of the oval window.

In its growth it partially or wholly occludes this opening, besides involving the stapedial footplate. The result being a more or less complete ankylosis of this articulation.

This bony formation may extend to other parts of the labyrinth, as the cochlea and semi-circular canals; but the above process,—ankylosis of the footplate of the stapes in the oval window,—is the characteristic pathological feature of this disease.

A very important point demonstrated by this authority—Politzer—is the histological characteristic of this bone formation; on account of its

immense spaces and Haversian canals, consists of a loosely formed bone tissue and very rarely of the compact variety. These spaces are filled with a connective tissue rich in cells, and also containing many bloodvessels, both large and small, in which are found scattered innumerable osteoblasts and osteoclasts. The bone corpuscles being far more numerous and compact in this condition than in the normal state.

From this we can surmise that an abnormal osseous tissue formation, such as this occurring, must be the consequences of a system of pathological warfare being waged between these two opposing factions and resulting in this bony growth of a lower order of development.

In addition to this Siebenmann cites a case in which the post-mortem revealed a condition of rarefication or spongifying of circumscribed areas in the bony labyrinthine capsule. Besides accompanying it was an existing osteophytic formation or hypertrophy.

(In this connection we must ever remember that a rarefication of bone tissue also occurs in this location in the later forms of syphilis.)

His explanation of this process is that it consists of an absorption of the bony tissue in this region, and its replacement by a spongy osseous formation of a lower order of development. This absorption process occurs in the Haversian canals; while the cartilagenous tissue, wherever present, is dissolved and replaced by a newly-formed osseous tissue of a spongy texture.

He attributes this tendency to occurrences in the labyrinth as due to existing remnants of primary embryonic cartilage remaining unossified in this site. When from any undue irritation or excitement it takes on this formation of osseous tissue.

In regard to the treatment of this condition, as I have said before, otosclerosis is a disease which has been from the beginning pronounced by all our old school brethren as incurable.

Must we follow in their wake? Can we not think for ourselves?

In the past, before the pathology of this disease was understood, such might have been pardonable; but now, knowing exactly what we have to contend with, I do not think we are justified in taking such a stand until much more has been done in this direction than in the past.

The condition we have here—an abnormal osseous growth in the labyrinth—is identically the same pathological and histological process possible of occurrence in any other portion of the bony frame. Yet in which latter locations, as demonstrated by the past, these conditions have been repeatedly amenable to our methods of treatment.

Has this same form of treatment been tried in otosclerosis?

It would seem not from the list of remedies that have been suggested by the various authorities who have written on this subject.

If so have they been given a fair trial?

In the treatment of this disease hitherto it would seem that we have prescribed too much for the presenting symptoms than for the existing pathological condition, and yet while, without wishing in any way to undervalue their importance, I think that here they must be relegated to the background as our sole guidance for the selection of our remedies.

Our first thought in the selection of a drug for this disease should be for the actual existing pathological condition. If in the pathogenesis it possesses symptoms experienced by the patient, so much the better, but if not we must not consider their absence in any way a contraindication for its use.

A most encouraging point to bear in mind here is that we have present a bone formation of loose and spongy texture, filled with Haversian canals and blood-vessels. Not a hard compact tissue.

The significance of this must be apparent to all of us, and should tend to stimulate us in our labors to an increased zeal. As by means of this vascularity permitting an easy access of the influence of the remedies to the spot, as well as being a valuable medium for the absorption of these pathological products.

In the compact form such is not a possibility.

Owing to the comparatively short time the writer has given the following described methods a trial, the results he has obtained therefrom have been most encouraging and promise much in the future. Still they must, however, be considered somewhat embryonic. Besides, as in this disease lapses are common, as well as periods in which there may be a complete standstill in the progress of the disease for variable durations time is an essential factor in determining the authenticity of a cure.

However, results have been obtained, as improvement in hearing, tinnitus or subjective noises lessened or stopped, even bone conduction diverted toward the normal; when such as this takes place we are led to assume that our treatment is not in vain.

Such results the writer has obtained by means of a somewhat irregular rotative administration of remedies suited to this condition, which he hopes time and experience will enable him to reduce to a systematic method of procedure. Guided by the symptoms when falling under the pathogenisis of the drugs used, and when not, simply for their action on the abnormal lesion present.

Remembering that in all of these cases we must expect to allow a long time to elapse before any perceptible benefit can be expected. In fact, several months to even years being sometimes required.

Patients not willing to give this amount of time should be advised in the beginning not to commence treatment.

Assuming as the writer does that uric acid is the primary causative factor of otosclerosis; a condition the result of a faculty mode of life, besides improper diet and bad habits in general; consequently we usually find these patients in every way presenting the indications of such.

This, therefore, requires fully as much consideration as the existing otosclerotic condition. Decidedly more than the simple administration of drugs, which, although of inestimable worth when the source of the trouble is eliminated, are powerless until this is accomplished.

To expect results by such means alone is about as reasonable as to look for a cure of the effects of opium or alcohol poisoning while the individual is still plying himself with these agents.

In cases such as these our first procedure would be to put a stop to their use before attempting anything in the line of treatment.

In the case of uric acid, however, fully as pernicious in its effects, the only difference being that it is generated inside of the body, while these agents are obtained from the outside, we seemingly ignore this fact and give drugs without attempting in any way to eliminate the toxic agent or prevent its formation. Under these circumstances how can good results be expected from any such procedures, except as has already been obtained. Therefore, if we wish to accomplish anything in the treatment of otosclerosis, we must direct our efforts towards remedying the uric acid condition, invariably present as a causative factor, and also effecting its complete elimination as essentials to any hopes of relief.

Regarding the methods employed for the removal of this factor in the disease; as I have already written in full upon this subject to repeat this would be but to tax your patience as well as to take up valuable time. Suffice to say, that hygiene enters very extensively into its essentials, and without which I do not consider that any satisfactory results can be obtained.

Foremost of all diet being a most important factor in the prevention of the formation of this agent (uric acid), to accomplish this end a complete abstinence from the xanthin forming bodies, tea, coffee and chocolate, is absolutely essential, as well as a very sparing indulgence in meat is also necessary for the successful carrying out of this form of treatment.

Eliminants to remove the retained and non-excreted waste products are recommended in the beginning, but not necessarily later, if the proper diet and mode of life is afterwards observed.

Following upon this treatment for the functions, organs or portions of the body deranged by the presence of this agent will be necessary, as some of these will most likely be involved as a sequelæ. When this is accomplished as far as possible and consistent with the amount of damage done by this agent if in a condition of long standing; we may then expect results in the treatment of the otosclerosis. Of course bearing in mind that the uric acid treatment is to this condition but a prophylactic in the preclusion of any further inroads of the disease.

Whatever pathological aural condition is here present; for this we must adopt a different mode of treatment to remove by absorption the abnormal osseous formation already existing in the labyrinth. When this uric acid diathesis is overcome, then will our remedies be given full scope to act; but until we do institute such measures in individuals of this class I do not believe that any drug in our Materia Medica is capable of effecting any beneficial results whatever in this disease.

This being accomplished we may then commence our treatment for the labyrinthine complaint, for which I would suggest the following remedies:

Hydrastis canadensis, 1-3 gt. t. i. d. has proved a remedy of great worth to the writer. A valuable agent, both for the incipient and early stages of this disease, as well as a seeming prophylactic to the extension of this process when the condition of osseous formation has already taken place in the layrinth. Not for the bone condition *per se,* as this requires an entirely different class of remedies. But in its proper sphere, however, it is of great value in this disease.

Its action being either by means of a stimulating of the saprophytic function of the blood, or else acting directly upon the pathological processes generating these depraved bone corpuscles, of which a large number are ever present in the blood of the labyrinthine capsule of these patients.

But whatever the action may be the disease products are rendered inert and a further extension of the process is consequently stopped.

In short, as our friends of the laity with a medical turn of mind would express it, it "purifies the blood."

Our brethren of the old school have already recognized the value of this remedy as to its possession of this same property, and in appre-

ciation thereof have placed it in that class termed by them "alteratives," i. e., drugs the action of which is to cause an alteration of tissue. Which, although a term of seeming indefiniteness, yet here we have taking place the same identical process.

At all times, however, bearing in mind that to obtain the full remedial value of this as well as of all other drugs in this condition, an uric acid treatment must ever precede and accompany their use. Besides this, as a very important and necessary factor, plenty of time must be allowed for the action of these measures. As well as at all times explaining to the patient, that as this disease has been many years in its coming, from its nature it cannot be other than a long time in taking its departure.

The writer has found this remedy (*Hydrastis*) in the condition from its signs presumably otosclerosis—a means of frequently increasing the impaired hearing power, and at times relieving the tinnitus; besides causing a seeming standstill in its progress as well as in general proving of great value in this disease.

Graphites. Of all the remedies that have been suggested and tried for this complaint none have until recently been more popular than *Graphites.* And never was a reputation more undeserved than in the case of this one.

For some inexplicable reason a tradition has been handed down from time immemorial as to the efficacy of this drug in otosclerosis. But notwithstanding all this in the experience of not one of us has this remedy ever proved in the slightest degree of any real service in this disease. Whatever results, if any, that gave it its original reputation must have been due to the impurities present in the specimen used at the time. Which, as this would consist of *Calcium, Silica,* etc., we can readily understand why results of some kind could have been obtained. But this agent in its absolutely pure form, which we are supposed to use, and consisting of plumbago or pure carbon, such I do not consider from past experience capable of accomplishing any results whatever in this disease, and on which point I think the consensus of opinion of the medical profession are in accord with me. Therefore, in this condition *Graphites* is a drug which I think the less time we waste over its use so much the better it will be for our patient's good and our own reputations.

The following remedies used by the writer in an irregular system of rotation have yielded good results. Administered upon existing symp-

toms, if present, or if none, for the pathological condition assumed to be present:

Silica 6x, for its known value in all osseous lesions.

Calcarea ost. 6x, also in like conditions, especially when symptoms of non-development and lack of nutrition seem present.

Calcarea flor. 3x, of the greatest worth in bone overgrowths.

Calcarea phos. 3x, upon its accredited properties in these conditions.

Aurum mur. 2x, in old broken down subjects, with its characteristics.

Iodide of soda or of *Potash,* 2x to 1 gr. doses, often serviceable.

Phosphorus 3x, recommended by Silbermann as having been of some benefit in his cases of this disease, also having been of some use to the writer.

Hecla lava 3x. Its composition *Silica, Aluminum, Calcium, Magnesium* and *Ferric Oxide* a combination of most excellent remedies for the condition such as we have existing here, is a most valuable remedy and having well served the writer in several instances.

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J. Compton Burnett has reported the performance of some remarkable cures with this remedy in cases of exostoses and osteomas in various portions of the body. Its possessed properties are that of reducing these growth by a process of absorption of the bony tissue. A fact which has been fully demonstrated by clinical experience.

We are informed by him that the action of this remedy is more satisfactory in conditions characterized by the presence of loosely formed spongy bone rather than in that consisting of the compact formation. The identical structure we have present is otosclerosis, as demonstrated by post-mortem examinations made on these individuals.

Its homœopathicity to this disease is unquestioned, as Wilkinson informs us that bony exostoses have been repeatedly found growing on the cattle and other animals in Iceland feeding in the pastures where the fine ashes of Mt. Hecla have fallen. Besides in some cases he (Burnett) informs us that where this remedy was given by him for these conditions it caused such pains in the growths as to necessitate its discontinuance.

Where such as this occurs the indications for its use are the more pronounced, and we may then feel confident that we are on the right track.

In such a case, however, the remedy should be discontinued for a time and given in a higher potency after this period of rest.

In the later stages of this disease the writer has obtained some re-

sults of seeming relief, especially for the impairment of hearing and also the tinnitus. As to the general condition it is as yet too early to claim any lasting benefits, although some results have been obtained as to a seeming retardation of the progress of the disease.

In concluding, the writer would say that with this small list of drugs he has obtained some results of a sufficiently encouraging nature as to warrant a further trial in their use. Truly this would not seem much in most diseases, but here we must all admit it is a great deal.

While at present the writer does not feel assured in promising anything until further proof has been forthcoming, feeling a certain amount of hesitancy in the face of the verdict of the past regarding the hopelessness of any cure whatever for this disease, still is buoyed up by the hope that something, even an amelioration of this condition, is possible.

And most earnestly hoping that the fight be not given up until we have done everything, in regard to which we are as yet nowhere near the end. Not until we have given all measures a thorough trial, including as well plenty of time and patience (the latter virtue being sadly lacking in some of us), these all are absolutely essential to obtain the desired results.

In concluding, I would say that these ideas to my regret are seemingly meagre, but I give them for what they are worth. If, however, they accomplish the object sought for will then be much. But as it has hitherto been the admission of all that we possess no means of treatment for this disease, therefore suggestions at least be worth a trial on the part of all of us.

Should they fail surely we are no worse off than we were before.

Geo. H. Rhodes: A paper which bears evidence of original research like the one to which we have just listened, can but give pleasure to all of us who have come to regard otosclerosis as an incurable disease.

It is a disease which aurists frequently meet, and any new treatment which gives any promise of success commands our interest.

There has been, in the last ten years, tremendous advance in our knowledge of the pathological changes which take place in this disease. The researches of Pulitzer and others have demonstrated that the lesion is in the capsule of the labyrinth, especially in and about the oval and round window.

We are beginning to know something of the causes of the disease, too. I cannot agree fully with the writer that all cases are due to uric acid. Probably many can be traced to that origin, but in many cases there seems to be no tendency in that direction.

Without doubt a disordered nervous system is responsible for many attacks, or at least is intimately connected with them.

Heretofore new treatments for this disease have been wanting. All have admitted its hopelessness. When a new bone formation develops in the capsule, it does not seem reasonable to expect drugs to remove it any more than when such a formation is found in other parts of the body. The drug that will absorb exostoses is unknown to me. In fact, I can recall no case of otosclerosis which has come under my observation which has been in any degree benefited by the use of drugs beyond the improvement in the nervous condition.

It is good, therefore, to hear that the author is meeting (or hopeful of meeting) with success in the treatment which he has outlined.

I believe with him that it is unwise to tell such patients at once that their condition is hopeless. They are usually nervous and despondent and to tell them after a careful diagnosis that they must soon loose nearly all their hearing is cruel and harmful and would tend to increase their deafness through increased nervousness.

By giving occasional treatments, while holding out the hope that we can preserve what hearing still remains, it is possible to strengthen them morally and indirectly help the hearing by improving their general health.

I sincerely hope Dr. Dickie will continue his observation and treatment of this dread disease as he has been doing, and that we shall hear in future meetings of definite results.

It would be an incalculable blessing to thousands of sufferers if some drug could be found to arrest or cure this common, yet hitherto incurable, disease and the only way to bring about such a result is to take courage and investigate as Dr. Dickie is doing.

S. S. Kehr, M. D.: The subject under discussion is a most interesting and important one to us as aurists. It has been discussed by this society at previous meetings with a great deal of interest. The author presents it to us for consideration in a clear and concise way, and merits a full discussion. Most of us have come to regard the condition originating in a uric acid diathesis. A great many of our catarrhal conditions—disposition of persons to take cold—is due to a uric acid diathesis, and will account for the bony changes which occur in the vestibule and cochlea, but particularly about the round window and stapedio—vestibular ligament. The sclerosis generally exists in families who are predisposed to uric acid conditions. Deafness comes on at a certain time of life, the disease gradually progresses until it eventually removes the hearing entirely. It is possible in a large number of cases to anticipate the probable development of sclerosis later in life, and by proper treatment the tendency may be modified. There are many children in whom we shall ultimately anticipate such change in the ear, and we may hope to prevent organic chances that otherwise would be inevitable.

The important point in these cases is the necessity of distinguishing between those in which we have post-pharyngeal, pharyngeal or nasal involvement which need correction, or in which we have simply hereditary tendencies to scleroses of the middle ear structures, which need

medication with the properly indicated remedy. The homœopathic Materia Medica contains many remedies that will produce molecular changes in the human body and thereby prevent these organic changes which ultimately result in fibroplastic adhesion.

Diet is a very important factor to be considered in the treatment of this class of cases; nitrogenous foods must be indulged in very sparingly; tea, coffee and chocolate must be absolutely prohibited, which are not properly cared for in the system. The extra work thrown upon other organs disturbs nutrition. Excretion of waste is interfered with.

Exercise is another factor to be remembered in the treatment of these cases, and must not be indulged in to excess. The amount and kind of exercise is to be determined by the physician. It may be necessary that the patient change his occupation to obtain results. A change of climate may be beneficial and should be well considered. Last, but not least, baths must be remembered, and the kind of bath for each case must be well considered, according to the end desired.

My general custom in treating otosclerosis is to use mechanical measure—massage and electricity—with the indicated internal remedy, and my results are better than when I use either one alone.

The remedies given by the author of the paper under discussion are very important and are the ones most frequently indicated. He gives their indications so clearly that there is no mistake as to the particular cases they are suited to.

There are other remedies that are not mentioned by the essayist that are frequently indicated, and good results are obtained by their use.

Kali mur. must not be forgotten in the early and middle stages of deafness, associated with Eustachian and pharyngeal catarrah; hyperplastic conditions of the middle ear, which are preceded by hypertrophic states, external canal dry.

Great retraction and reduction of the handle of the malleus; cone of light, very small. Granular conditions of the external meatus and membrana tympani. Closed Eustachian tube. Walls of the external meatus atrophied. Snapping and noises in the ears.

Mercurius dulcis; extension of catarrh of naso-pharyngeal mucous membrane. Membrane retracted, though movable by inflation. Slowly increasing deafness. Tickling in the Eustachian tube, membrane of the pharynx about the Eustachian tube thickened and sensation as if the parts were scalded.

Kali iodide; tinnitis a marked symptom; atrophy of the glandular structures. Hypertrophy of mucous membrane of nose and pharynx. Specific taint. Darting pains in the ears. Frequent attacks of pseudo hay fever.

Other remedies are *Plumbum, Zinc phosphide, Alumina, Kali bi., Baryta carb.* and *Iodide* and *Iodine.*

Dr. J. W. Jewett: It would seem that the title is not the best that could be had. One of the means of diagnosis that the doctor places dependence on is the "tone gap," and it would seem that this is the

important symptom in its diagnosis. His definition of otosclerosis, that it is a "disease consisting of a gradually increasing impairment of hearing, usually accompanied by tinnitis of a more or less degree of severity," is not a clear one. We may have this condition of things with a number of the diseases to which the ear is subject. To the writer it would seem that the German nomenclature is the better, and that "tropho-neuritis" is the better term.

Do we ever find cases of this disease condition without any middle ear lesion and presenting no visible signs of its existence? Rather are they not all acquired, with an adhesive cause in the Eustachian tube, rarefaction and absorption of the air in the tympanum, depressed membrana tympani, preventing proper motion of the ossicles, and consequent impairment of the hearing. The fact of bone conduction being better than air conduction would lead to the belief that some of the lesions were to be found in the tympanic cavity. This condition would also be present if the footplate of the stapes were completely anchylosed in the fenestra ovalis. In such cases all sounds would be heard with less distinctness, but when there are sound gaps it would point directly to an interference with the sensory filaments of the auricular nerve somewhere in the scala media of the cochlea.

As to the treatment: First, let us see what some writers have to say of the remedies advised. The botanics use *Hydrastis* as a "detargent" in chronic catarrhs of mucous membranes. Biddle says: "It is tonic as well as diuretic, and a very efficacious diuretic in promoting the discharge of calculi from the kidneys." Bartholow says: "The bodily condition, or constructive metamorphosis, is promoted by its administration. Used in chronic catarrh of all mucous membranes." Hughes says: "*Hydrastis mur.* gr. j. to aq., one ounce, has marvelous control over chronic catarrh of mucous membrane wherever situated." He recommends it in otorrhœa, locally and internally. Vehslage and Hallett say: "For the ear condition, which may occur with its characteristic conditions elsewhere, and particularly in the naso-pharynx. Thick, tenacious and ropy secretions. Dull frontal headache."

Having a "marvelous control over chronic catarrh of mucous membrane wherever situated" may we not look to Hydrastis as one of the eliminants of uric acid to a partial extent at least? Dr. Dickie is using it in a much more material dose than is usual with the majority of homœopaths, but if he is getting the results it is the homœopathy. The doctor uses his other remedies, *Sil., Calc. ost., Calc. flour.,* and *Phos., Aur. mur., Kali iod.* and *Phos.,* not homœopathically, but in a sort of hit or miss manner, as he distinctly says, "administered upon existing symptoms *if present* or if none (symptoms?) for the pathological condition *assumed* to be present." Of the use of Graphites in this condition the writer agrees with Dr. Dickie that the least said the better.

If the condition known as otosclerosis be present, and in order to obtain the full remedial value of all drugs in this condition, an uric acid treatment must ever precede and accompany their use, how much

of the good effect of the treatment in which Hydrastis or other of the remedies mentioned is used is due to the homœopathic remedy and how much to the uric acid treatment?

As physicians the writer believes that we should at all times and under all considerations avail ourselves of everything that can in any way give our patients relief, thereby proving that we *are* good physicians and not bigoted and narrow-minded men.

A few questions may be pertinent. The doctor says that plenty of time must be allowed for the action of these measures. How long is it necessary for the uric acid treatment to precede the use of the indicated homœopathic remedy? How long after beginning the uric acid treatment has he had to wait to see results? Has there been any beneficial effects from the use of the uric acid treatment alone, or has he supplemented it with the use of the hydrastis before any manifestations of improvement were noticeable?

Cimicifuga in material doses, five to ten drops of the tincture three times daily, has been recommended by our colleagues of the old school in this condition. The writer has used it in only one case, and in that case there was an improvement quite marked, but as only about one and a half years have elapsed since the administration of the remedy a cure is not claimed. *Cimicifuga* or *Actea racemosa* could hardly be classed as an anti-uric acid remedy, though it has a justly earned reputation as a remedy in certain forms of rheumatism. In the case cited this was the only treatment used.

In conclusion, a closer discrimination between the results obtained by the use of the uric acid treatment and that obtained by the use of the remedies would be desirable.

A CLINICAL CASE WHICH PROVED INCURABLE; WHY?

BY ISAAC C. SOULE, PH. D., M. D.,

Kansas City, Mo.

Mr. R. C., age nineteen, consulted me first September 17, 1900. General appearance typical of good health; has in fact never been sick and has no complaint, except the eye trouble which has brought him here now. Weight, 185 pounds; height, 5 feet 11 inches; complexion, dark; eyes, gray; slightly squinting lids, the edges of which are red.

Vision is fairly good, but since he first entered school (of which he is not at all fond) has been troubled with a smarting, burning pain in the eyes, which is worse upon using them at the near point. This trouble has been growing worse for the past few years, until now it is impossible for him to read for more than a few moments (three or four), when he is obliged to close the eyes and not infrequently bathe them. This is a great hardship, as he is a great reader.

Eyes are worse in sunlight and in the wind. Headache through the temples. Tention normal; light reaction normal; disks of both eyes slightly flushed, otherwise normal.

Refraction—O. D. Ophthalmometer gives an astigma 1.7, vision $^{20}/_{50}$, with — 2. D. S. combined with — .62 D. Cy. ax. 180, vision = $^{20}/_{15}$.

O. S. Ophthalmometer gives astigma of 1.2 D., vision $^{20}/_{20}$ accepts + 1.50 D. Cy. ax. 90, vision = $^{20}/_{20}$; no improvement.

Used Scopolamine $^{1}/_{10}$ of 1 per cent., two drops in each eye, and directed him to return the following day. Repeated the Scopolamine, and at the end of an hour made the refraction with the following result: O. D. vis. $^{20}/_{60}$ a plus 1 D. S. combined with a plus 1 D. Cy. ax. 85 gives vis. of $^{20}/_{20}$ plus.

O. S. vis. $^{20}/_{50}$ a plus. 25 D. S. with plus .75 D. Cy. ax. 105 gives vis. $^{20}/_{20}$, both eyes combined have vis. $^{20}/_{15}$.

Refraction was made by skyoscopy and trial lenses. Full correction given for constant wear.

November 30th. Has worn correction constantly as requested, and has refrained from the use of the eyes as much as was possible, having had his lessons read to him and doing no work with pen nor pencil. Thinks that there is a slight improvement, especially as regards the aggravation from light and wind. The muscular balance was now looked into with the following result.

Light was at 23 ft. in all tests. Stevens Phor. gave Es. 2 to 3 degrees; lights could not be kept stationary. Maddax Rod 3 degrees Es. R. Hyper.?

Maddax Rod and Steven's Phor. combined gave Es. 3¾ degrees, R. Hyper. ¼ degree. Maddax Rod with Jackson triple variable prism and heavy cobalt glass gave Es. 3¾ degrees, R. Hyper. ¼ degree. Adduction 19 degrees, abduction 10 degrees. Abduction and adduction tested with a double battery of prisms and also with Jackson's triple prism, with practically same results.

In estimating the muscular balance at the near point (14 inches) a small ivory cross, the arms of which measure $^1/_4''$ by $^1/_{32}''$, mounted on a black velvet background, was used for Stevens' instrument, and an ivory line $^1/_{32}''$ wide by 4" long having a square $^6/_{16}''$ large above and below, in its center, mounted on black velvet, was used as the test object with the Savage double prism, 14 inches was the distance at which both objects were placed.

Stevens' instrument gave an Ex. of 3½ degrees, Savage's an Ex. of 3, both gave an uncertain degree of R. Hyper.

My diagnosis was convergence spasm from weakness of the internus, which had been heightened by the minus glasses he had at various times worn.

Treatment continued the wearing of the full correction at all times, weighted rythmic, convergence exercise, at the office each day, followed by massage with vacio-vibrator, both to the eye-ball and the base of brain for five minutes each. Remedy, *Nat. mur.* 6x.

December 28th. Sometimes thinks that he is somewhat better, but the next day, or perhaps in a few hours, cannot see any improvement.

Examination of the muscular balance (same tests as before) shows at distance Ex. 2 degrees, R. Hyper. ¼ degree, at near point, Ex. 6 degrees, R. Hyper. ¼ degree. Adduction 43 degrees.

January 22, 1901. At distance has from ¼ to ½ degree of Es. At 16 inches Ex. 1½ degrees. Not sure as to Hyper. Adduction 65 degrees.

Complains that eyes ache, pain in temples and entire front part of the head. Eyes smart only when using them or from wind blowing in them. Are worse if used by lamp light. Eyes occasionally seem to jump, letters blur. Bowels regular, appetite good, absolutely no other symptom. *Nat. mur.* 1 C. M.

February 12. About the same complaints as in January. Orthophoria at distance. Ex. of 2½ at 16 inches. Adduction 78 degrees. Pres. *Jaborandi* 3x t. i. d.

March 8. Thinks he is somewhat better, but still has trouble at near point. Changed lenses to O. D. plus .38D. S. combined with plus .50 D. Cy. ax. 85 with prism of ¼ degree base down. O. S. plus .50 D. Cy. ax 105.

As there had been perfect balance at distance since February 12, the treatment was discontinued except the remedy, and he was sent out on a farm taking a supply of *Onosmodium* 3x.

June 6. Has been out in the country since last report. Says that he is comfortable until he attempts to use eyes at the near point, when the old troubles return almost as bad as ever after he has used them for half

an hour or so. Examination of the muscular condition show no trouble at distance, but develops an Ex. of 3¾ degrees at 16 inches.

With the glasses off the R. Hyper. of ¼ degree still show both at the distance and at the near point.

He declined further treatment at my hands, and said that he had concluded to try some one else.

During the treatment of this case I was consulted by the mother who had much the same muscular condition as the son, but the proper lenses for near and distant wear gave her perfect comfort and still do.

Recently the mother called to have her lenses changed, and stated that the boy was in the West working in a government position, where he was out of doors most of the time, that he had consulted two or three oculists on the Pacific coast, and been under treatment several times by one or the other of them but with no better results than attended my efforts. I also found out that at least two reputable men had made failures before I saw the case, one of whom was my friend and colleague, Dr. Delap, who treated the case for a year just prior to its coming to me.

Both Dr. Delap and myself advised and insisted upon an operation being made upon the superior rectus muscle but neither of us could gain consent to do the work.

Question: Would the surgical procedure given any better results; if not, what would?

1103 Main Street.

TREATMENT OF TRACHOMA BY ELECTROLYSIS.*

EDGAR J. GEORGE, M. D.,

Chicago, Ill.

THERE is no disease of the eye that has been more obstinate and baffling in its treatment than trachoma. The ravages of the disease, as well as the heroic treatment practiced, bring about structural changes that frequently result in the most distressing secondary conditions of a chronic nature.

In the primary or acute stage, the granules themselves are a source of great irritation by friction on the corneal epithelium, causing heat, photophobia and lachrymation. In this stage complete cure is sometimes effected in the mildest cases, and even in the severe forms, but only when subjected to an early and rigid treatment, by the usual methods. But in spite of the best of treatment the majority of cases assume a chronic condition that exists for months and even through life.

The most frequent complications that arise are pannus and ulceration of the cornea. Pannus is claimed by authorities not to be entirely due to frictional irritation, but to a change in the epithelium similar to that of the conjunctiva. In this opinion I differ, as experience has proved since adopting electrolysis as a treatment that pannus is the result of friction alone, that the newly formed vascular tissues as well as ulceration disappears when the granules or cicatricial bands of the conjunctiva have been absorbed.

In the natural course of the disease, the conjunctival hypertrophy gradualy increases until a certain height is reached, when it slowly disappears, leaving the conjunctiva in a cicatricial state. In some cases the contraction is so great as to cause entropion and trichiasis. Even after the acute stage of the disease has apparently spent itself, pannus persists as a result of cicatricial irritant.

The treatment of trachoma is mechanical (or surgical) and topical. The use of Knapp's roller forceps or the thumb-nails to squeeze out the granules is a method much in favor. Grattage, excision, curetting, destroying the granules.

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*Read before the Illinois Homœopathic Medical Association.

electrolysis and galvano-cautery are also employed. Topically such irritating applications as Bichloride of mercury, Nitrate of silver, Blue stone, Alum and Tannic acid are used for the purpose of absorbing or

After the cicatricial stage is established, there seems to be no treatment recommended in our text-books to dissolve the cicatricial bands, prevent relapses, clear pannus and restore these poor unfortunates to a useful life.

Through the suggestion of Dr. Chas. Neiswanger, who is well known as an authority on electro-therapeutics, I began the use of metallic electrolysis for the treatment of trachoma. Some seven or eight years ago the doctor reported the cure of several cases and recommended its use. I have employed it for the past year or more, both in my private and clinical practice, with the most gratifying results.

The treatment is simple. Galvanism is used. The positive pole is armed with a smooth oval copper electrode, the negative pole is held by the patient in the hand, the eyelid is everted and the positive electrode is applied to the conjunctiva, being slowly carried over its entire surface, even to the fornix, for one or two minutes, Two to three milliamperes is a sufficient current strength. The strength and length of treatment can be increased acording to the severity of the case, but the given amount in time is all that can be well borne, and will be found sufficient. Two treatments a week will be all that is required.

Cocaine anæsthesia is essential for the relief of pain. In connection I would recommend the use of Adrenalin prior to Cocaine. It is well known that Cocaine locally does not act readily on inflamed mucous surfaces, but by rendering the membrane anæmic anæsthesia is obtained.

To relieve the irritation following the treatment use cold applications.

In the beginning of the treatment of each eye it is essential to brighten the electrode in order to remove corrosion caused by chemical action, otherwise a perfect result cannot be obtained; this may be done with emery paper, file or by scraping.

The therapeutical value of this treatment is that the metallic electrolysis deposits, or drives into the tissues, a metallic salt, the oxychloride of copper. This salt acts as a counter-irritant, and is driven cataphorically into the conjunctival tisues to its fullest extent. During the process of the treatment the chemical change of the tissue is very noticeable, the mucous membrane becomes slightly greenish as well as the secretions.

In looking over the writings of several authorities on electrolysis, I

find that Scheppegell says: "In metallic interstial electrolysis, the salt is not only dissolved from the metal, but by a further property of the current, it is forced into the tissues and in this way this method gives great advantages over topical applications. When a copper needle is inserted into organic tissue and connected with the positive pole of an electrical circuit, a chemical decomposition takes place and a number of acids, such as hydrochloric, sulphuric and others as well as oxygen are liberated. These acids, principally hydrochloric, combine with the copper and form an oxychloride of copper in the nascent state. This salt is very diffusable, its effect being aided by the cataphoric action of the current, so that it is deposited not only in the tissues immediately around the needle, but also at some distance." Scheppegell also quotes W. J. Morton as follows: "(1) The salts of many metals may be electrically dissolved from metallic electrodes, and at the same time be caused to penetrate human tissue to a considerable depth. In the case of copper upon dead tissue, with current usually applied to living tissue, this depth is visible as an apple-green color in the radius about the electrode from one-fourth to one-half of an inch; it probably extends invisibly much farther, shading off to a minimum.

"(2) The electrically formed and the electrically diffused metallic salts are not destructive to tissue in the sense that ordinary electrolysis is; the effect is rather by the presence of a partially insoluble salt and by the effect of a newly formed organo-metallic salt, denutritive or absorbing upon diseased tissue.

"(3) It would seem to the writer that these electrically formed salts possess a selective affinity for diseased in preference to healthy tissue, or at least produce a more profound action upon morbid tissue, causing a favorable alteration in the nutrition of the part.

"(4) Electric diffusion is greatly superior to topical applications, for the reason that the medicament is caused to penetrate the tissue acted upon."

In the employment of this treatment for trachoma, the same tissue changes take place and chemical action is obtained by the direct contact of the metallic copper electrode to the conjunctival mucous surfaces, as if the treatments were interstitial. Metallic electrolysis certainly accomplishes everything in this disease that the authorities here quoted claim. It reduces granules and hypertrophied tissue in the acute stage, and absorbes cicatricial bands in the chronic; what is more, it does this without destruction of or tissue changes that follow the regular and radical line of treatment, consequently for this reason it will be found superior to any other methods employed at the present time.

ELECTRICITY IN DISEASES OF THE NOSE AND THROAT.

BY J. MARTINE KERSHAW, M. D.,

St. Louis.

WHEN carefully employed, electricity is a useful agent in some diseases of the nose and throat, such as cartilaginous spurs, deformities of the septum, and some posterior turbinal hypertrophies. With the several other means of treating these difficulties, electricity compares favorably in the hands of those who have the proper apparatus and instruments, and know how to use them. It is my opinion, however, that much harm has been done by this agent because of faulty apparatus and instruments and through ignorance on the part of the operators. Those most familiar with electricity as a therapeutic agent and surgical help, are most careful in employing it; while those who know little of its uses and the damage to healthy structures that may follow its improper employment, are far from conservative in their mode of using it. The trouble with electricity is that one is apt to do more than is intended when operating. When the surgeon undertakes to destroy a little tissue, he may destroy three times as much as he intended, or as the needs of the case demand. When he means to destroy diseased tissue only, he may set up active inflammation of healthy tissue. Treatment of diseases of the throat and nose by means of electricity, has led to serious consquences in not a few instances. Middle ear disease, tinnitus aurium, deafness, intractable ulcers, perforation of the septum, etc., have followed the careless employment of electricity in the treatment of the nose and throat.

For the reasons above given, electricity should only be employed in selected cases, and the operator should be careful and conservative. The physician not familiar with the agent under discussion should not use it at all where the diseased parts cannot be illuminated, as its improper use is frequently followed by difficulties that are irreparable. Electricity is employed by nose and throat specialists much less than formerly, but they use it with judgment begot of experience, and excellent results are the rule when employed carefully as indicated in this paper.

DISCUSSION.

Dr. Teets: I fully agree with Dr. Kershaw that electricity is a useful agent when intelligently applied, and also does great harm in those cases where it is not indicated or carelessly applied. In using the galvano-cautery in nervous patients it is difficult to confine the cauterization to the diseased tissue. I know there are some who will say they have no difficulty in avoiding the healthy tissue, but after eighteen years experience I must confess I am still unable, in all cases, when cauterizing the inferior turbinal, to avoid touching the septum or the rim of the nostril with the heated electrode without some instrument to protect these parts. I had made for me, a number of years ago, a nasal speculum with sliding plates so as to protect the healthy tissue.

In hypertrophic rhinitis, especially the erectile form, good results follow the galvano-cautery, whether we puncture the tissue at different points or burn in one straight line over the most prominent part of the swelling. In a true hypertrophy of the inferior or middle turbinals, I believe we get better results and cause the patient less pain and inconvenience, by removing a portion of the tissue with Jaskson's scissors and the wire snare.

I wish the doctor, instead of speaking of electricty in a general way had given us the different affections in which this method of treatment can be used, and so bring out the experience of the members present. A number of experiments have been made to illustrate the cataphoric effects of drugs upon the nose and throat. When there is present erectile hypertrophy of the nasal mucous membrane, and in addition, the membrane is very sensitive to the sudden changes in temperature, iodine applied by this means gives satisfactory results. The tincture of iodine is applied to the negative electrode and inserted into the nasal passage, then placed over the sensitive area, the positive electrode being placed on the external nose. I have had made for me an electrode which I have used that seems to answer all purposes, and yet it might be improved upon. Many other drugs may be used in the same way, and at some future time I expect to write a paper on the cataphoric effects of drugs upon diseases of the nose and throat.

Scheppegrell claims that in tubercular laryngitis cataphoric application of Guaiacol give better results and with less discomfort to the patient than either curettement or lactic acid. Parenchymatous and peritonsillitis when treated by cataphoresis using the tincture of iodine and Belladonna, has given surprising results.

In pharyngomycosis I know of no drug or method of treatment which is followed by such prompt and satisfactory results as the galvano-cautery. A needle-point electrode is used, one like I hold in my hand, so as to destroy parasitic elevations or deposits. In using a fine electrode it is very easy to avoid injuring the healthy tissue. Where the healthy tissue has been accidentally touched, the inflammatory reaction following the cautery can be readily controlled by an application of the campho-phenique. Enlarged follicles and engorged capillaries upon

the posterior wall of the pharynx can also be treated with the galvano-cautery, and yields the most satisfactory results.

Atrophic rhinitis, when treated by electricity, in my experience, has not been followed by the prompt and satisfactory results noticed when other methods of treatment have been used.

In paralysis of the vocal bands, electricity has given most astonishing results when intelligently applied.

THE CORRECTION OF NASAL DEFORMITIES WITH PARAFFIN INJECTIONS.

BY EUGENE L. MANN, M. D.,

St. Paul, Minn.

PROPER environment is as essential for the development of an idea as of an individual. When in 1894, Dr. Corning, of New York, suggested the use of a solidifying oil injected between the ends of a divided nerve trunk to prevent their reunion, the mental environment of the medical profession was not auspicious, and the idea slept to be called into conscious activity in 1900 by Gersuny, of Vienna, and the real use of such injections begins at the latter date, since which time it has been used for a great variety of purposes, most of them for cosmetic effect. So great has this use become that we are beginning to see advertisements of firms who guarantee to correct all sorts of deformities by the injection of paraffin.

The use of paraffin solutions is based upon the fact that the paraffin so injected becomes solidified and encapsulated in the tissues and so remains inert. In a series of experiments upon rabbits undertaken at the dispensary of the Homœopathic Medical College of the University of Minnesota, it was found that in a period of from two to six weeks the bulk of the paraffin had become somewhat reduced, due probably to the absorption of a certain amount of oil contained in the mass; this absorption causing small soft depressions through which the new connective tissue formation insinuated itself, thus perforating and surrounding the mass of paraffin and accepting and habitating this foreign material in the natural body; it was found that the best results were obtained with the solutions having a melting point of 106 to 110 degrees Fahrenheit, such solutions causing no more inflammatory changes than the more liquid ones and retaining their shape much better. The pathological result of these injections seems to rest in exciting sufficient connective tissue new growth to fill up the interstices and encapsule the small masses of paraffin which then remain inert.

Dangers of the Injections.—First. The formation of emboli. In all

the rabbits injected with solutions of a melting point of 102° death took place in about two weeks from emboli. When we consider the normal temperature of the rabbit is approximately 102½°, the reason for this is evident. Reports by German operators of emboli from solutions of a high melting point are explained either by too high temperature of the solution at the time of the injection causing thrombosis in nearby veins and hence emboli, or else the injection penetrating directly into a vein.

It would seem that all danger from emboli could be avoided by proper care in the temperature of the solution, by avoiding the puncture of a vein of any size and the use of solutions having a melting point considerably higher than the normal or general fever temperature of the body.

Second. Poisoning. Aseptic paraffin solutions are non-poisonous. According to Jukuff, of Strausburg, it was found that unpleasant results in animals followed only when $^1/_{10}$ of the body weight was exceeded, so for all surgical purposes there is no danger from an over dose.

Third. Atrophy and necrosis of the tisues from too great pressure. This has occurred and we should guard against it. Repeated injections of smaller amounts are better often than one of large quantity.

Fourth. Septicæmia. This can be dismissed in a word. No injection should be undertaken without the most perfect aseptic precaution as regards solution, instruments and site of injection.

Fifth. The causing of deformity by either over-correction of previous depression or gravitation of the paraffin. Dr. Holbrook Curtis, of New York, presented at a recent meeting of the Academy of Medicine a young lady who presented two tumefactions on the side of the nose and border of the orbit. An injection had been made to correct a slight depression at the junction of lip and nose, and the paraffin had escaped in the tissue and caused the deformity. How could it be remedied?

Technique of Operation for Correction of Saddle Nose.—The parts having been thoroughly cleansed and rendered aseptic, and the paraffin solution liquified in a water bath, the solution is drawn into the syringe through a needle of large calibre, the air expressed and the whole immersed in hot water to keep the solution liquid. A word as to syringes. Early injections were made with syringes contained in the small aspirating sets. There are now special makes on the market; one by Dr. Quinlan, of New York, has the barrel enclosed in a water jacket through which hot water is kept circulating, as the trouble in rapid cooling is in the portion of the solution contained in the needle; this syringe does not

appeal to me especially, as it is cumbersome. In another one the piston is forced home by a screw action, a decided advantage, as by it an even flow is secured and the solution can be used at a much lower temperature—not much above that of the atmosphere. The tendency with the ordinary syringe and the liquid solution is for it to spurt as soon as the more solid portion contained in the needle is forced out.

The solution and patient being ready a small amount of a 2 per cent. aseptic Cocaine solution is injected as an anæsthetic; the point of the needle is now inserted well up on the bridge of the nose and forced down to the point of deformity. Now the tissues on either side of the nose close to the orbits being firmly compressed to prevent the solution escaping into the loose tissue, the injection is made slowly and evenly, the syringe being withdrawn as the solution is forced into the tissues. An assistant moulds the escaping paraffin into the desired shape, the point of entrance of the needle is sealed by collodion and cloths wrung out of ice water applied to hasten the solidifying of the paraffin and prevent congestion. Care must be taken to avoid pressure sufficient to cause necrosis. Repeated small injections act as kindly as one large one; separate injections may be made at intervals of two to four weeks, as soon as the congestion caused by the prior injection has subsided. The discomfort following such injection is slight. Congestion of the overlying skin may occur, lasting for a variable length of time, and it may be necessary in some cases subsequently to divide transversely some of the small vessels.

Results.—Although the first injections were made only about three years ago, there is every evidence that the results will remain permanent. If more than one injection is made care must be taken not to produce a nodular appearance.

Uses.—The main use made of the paraffin injections has been in the correction of saddle nose, though it is applicable and has been used in raising old cicatrices, especially those left after mastoid operations, and also for the closure of cleft palate. These solutions have also been used in cases of atrophic catarrh and ozæna. Accepting the hypothesis that roomy nasal spaces constitute an etiological factor in these cases and cause an inability to expel the secretions, which soon undergo putrefactive changes, and by their presence cause maceration and atrophy of the mucous membrane, Brindel, of Bordeaux, and others have reconstructed the inferior turbinated body by injections of paraffin so that the nasal chambers approach the normal calibre. The technique of the operation is similar to that described for correction of sadle nose. The

interior of the nostril is thoroughly cleansed and the injection made in the posterior part of the turbinated body. If further injection is deemed necessary it is made subsequently. It is important to select paraffin of a high melting point, and in some cases a temporary phlebitis of the facial vein resulted two or three days subsequent, but rapidly subsided. Where the mucous membrane was very firmly adherent to the underlying tissues it was either impossible to make the injection or the paraffin escaped into the nasal spaces. An examination of the cases three months subsequent showed absence of fetor and no abnormal intranasal secretion present. So that the results seem to be not only a more easy expelling of the crusts formed, but an actual diminution in their amount and a more natural moisture in the nasal mucous membrane rendering nasal respiration easier. Too short a time since these injections has elapsed to prognosticate definitely, but we welcome heartily any means of relief in these cases.

To sum up. Aseptic paraffin solutions are non-poisonous; when injected under aseptic precautions, they excite connective tissue growth which invades and encapsules the mass.

The melting point of the solution used must be above the temperature of the body (106° to 110° F. preferred). Care must be taken to avoid too great pressure and subsequent atrophy and necrosis of tissue.

The temperature of the solution at time of injection should not be high enough to cause thrombosis in surrounding veins; by use of syringe with screw piston the solution may be injected in semi-solid state.

Do not inject too much, as the solution once introduced is difficult, if not impossible, to remove.

Injections can be used wherever you have a firm, bony or cartilaginous base upon which they can rest.

Besides the use for cosmetic effects the solutions offer a promising means of improving cases of atrophic catarrh and ozæna; they have been used by the ophthalmologists, injected into the orbit after enucleation to secure a good stump, and have been suggested as a means of cure in chronic antral and frontal sinus suppurations by filling the cavity after thorough cleansing.

DISCUSSION.

Frank B. Seitz, M. D.: Dr. Mann, in whose company I had the pleasure of listening to many lectures in Vienna, presents in this paper an amplification and verification of a subject, or method, that has recently

been introduced into surgery, to restore various cosmetic defects, especially that of what Trendelberg has styled dog-nose. He cites more authorities than I have been able to consult, due no doubt to the fact that, as his paper shows, he has studied the subject very thoroughly. To discuss on short notice a paper prepared by another after months of preparation is either to take an ill-advised contrary view, to meekly coincide in all things, or, as I shall do, mention a few points he may have overlooked, or better still, may have thought of not sufficient interest to merit mention.

It was at Vienna, that pathological paradise, that place to which we can trace either directly or indirectly most of our innovations, that the first paraffin injection for the correction of a deformed nose was made some four years ago by Prof. Gersuny. Dr. Parsons, of St. Louis, made an effort along this line when he, in 1891 before our class, attempted to restore a sunken nose by inserting into it a piece of cartilage cut from the nose of a freshly killed calf.

The result was negative because of non-union. There were not vessels enough in the piece of cartilage nor at the points of approximation to establish anastamosis sufficient for nutrition.

While the practice of paraffin injections has been restricted to correcting cosmetic defects, and that mainly in the nose, there are suggestions as to its possible use in other fields. Some of them are: Restoring a turbinated body; raising depressed, atrophied and ulcerated spots in the nasal mucous membrane; closing a cleft palate; filling up the depression left by resecting a lower jaw, and after mastoid operations; filling in orbital fat after enucleation; strengthening lax and incontinent urinary and rectal sphincters, and so forth; all of which are rational, seem feasible, and afford a new sphere for experiment to those so inclined and have the opportunity afforded by access to a large clinic. I would hesitate to fill with paraffin or other permanent substance an empyemic accessory cavity.

If clean and healthy it would be uncalled for, whereas if the suppurative process had not been stopped the pus might burrow to more dangerous and less accessible places.

The technique, while the apparently simple one of injecting fluid into soft tissue, has requirements that cannot be ignored without risk of failure. Danger from sepsis and poisoning can readily be guarded against by observing the proper surgical rules of asepsis. Danger from emboli or thrombosis are well stated and worthy of careful consideration. I beg to add that while paraffin is an inert and non-toxic substance it may become surgically unclean by handling, and would suggest that instead of its being only melted, it be brought to the boiling point, then allowed to cool to the desired temperature.

The proper temperature of the solution seems, as yet, to be an unsettled question. The doctor advises one of about 106° F. Paraffin has a melting point of 110° to 115° F., certainly too hot a mixture to inject into living tissues without danger of sloughing; but as vaseline has a

much lower melting point, these can be mixed into a proportion to have a solubility at any desired temperature within a certain range. Dr. Kahlke, of Chicago, who reported a case by this treatment in the May, 1903, Clinique, used a mixture of the two at a temeprature of 99° F.; but in his conclusion asked what would become of the mass during fever or in hot weather. I think the patient's nose will run.

In conclusion, the subject of paraffin injection deserves investigation and experiment, not only because it promises to be of great value in relieving conspicuous, distressing and hitherto partly irremediable facial and other deformities, but because it has an added charm in possession, a quality rarely held by subjects discussed before this society, in that it is something entirely new and original.

R. S. Copeland, M. D.: We began the use of paraffin in nasal deformities in our town about two years ago, and have come to certain conclusions in reference to it. In the first place, it is not satisfactory to use paraffin with too high a melting point. We never used it with as high a melting point as 104°; a paraffin that has a melting point of not far from 100° is about right. That spoken of by Dr. Seitz in his discussion as having a melting point of 110° is, according to our experience, much too high. The substance that we used to bring down the melting point was white wax. After adding what seemed about enough we would draw up some of the mixture into a capillary tube and allow it to chill. Then by immersing this into water accompanied by a clinical thermometer and gradually bringing up the temperature we could determine the exact point at which it melted; of course, it should be above the temperature of the human body, but not much above it. Experiments have shown that the paraffin becomes permeated with tissue and encapsulated, and I do not think that a fever would cause the nose to melt and run away, as Dr. Seitz states. I approve of what Dr. Mann says about not using undue pressure. In one case that we operated on the tissue bulged out, and that was a warning that any greater pressure would be carrying it to a dangerous extent. We tried the procedure also in cleft plate, but it did not work satisfactorily. For the cure of saddle nose it is the most satisfactory thing in the world. If there is anything that a man would be tempted to advertise it is just that. The patient comes in reformed and in a short time goes out a changed and beautified man. I do not wonder that the quacks have seized upon it as a means of making money. When the injection is first made, before it has congealed, it is liable to run through the tissues, spreading where you do not want it. It is a good point to mould it into shape and then to retain it there by means of some kind of a splint for a short time until solidification has taken place.

Geo. B. Rice, M. D.: I have had some little experience in paraffin injections for the removal of defects of the nose and face. The first was last summer for saddle nose, the cause for which I could not learn. Two separate injections were made in this case. The first after the manner described by Dr. Mann; the paraffin was at the temperature almost of solidification, its melting point being 102°. An assistant

manipulated the syinge while I with the thumb and forefinger moulded the mass into shape, as it was forced into the tissues. After two weeks, when the inflammation had subsided, another injection was made to fill up a slight depression still noticeable. She was very much pleased with the result, and I regarded it as satisfactory. About a month ago she wrote me that the top of her nose was sore and that the doctor there had been putting hot poultices on it. She wanted me to advise her what to do by mail, but I insisted that she should come to me. She did so, and I found that there had been a little sloughing of the skin from the second injection. This sloughing and escape of paraffin had occurred six months after the second injection. I found a small opening from which I could squeeze the paraffin. I then applied peroxide of hydrogen and put on a collodion dressing. It healed up kindly. Perhaps the second injection caused enough inflammation to increase the nutrition of the subcutaneous tissues and thus obliterate the deformity, but certain it is the deformity was practically gone. We have another case at the clinic that I think we can bring in at our clinic to be held next Tuesday at the hospital. It would be exceedingly interesting if some one would take the case in hand and make the injection.

N. H. Houghton, M. D.: I hope, Mr. President, that you will use your persuasive powers to induce some expert to do this for us. I have a case that is to go to the hospital two weeks from today. If any can be induced to operate for us I will endeavor to have him come down on Tuesday.

Several voices—Dr. Mann! Mann!

E. L. Mann, M. D.: I thank you very much, but I prefer not to. In one case that was operated on about six months ago the general redness has subsided but there are quite large veins at the side of the nose. Another case was one in which there was absence of the lateral cartilage of the nose. We tried unsuccessfully to reduce it. After a week or two it pushed the wing of the nose down. I hoped that some member had had experience with this expedient in atrophic catarrh. I had a case that was coming to have it tried but they got frightened away.

THE OPERATION FOR CATARACT.

BY ROYAL S. COPELAND, A. M., M. D.,

Ann Arbor, Mich.

THE end to be accomplished by an operation for cataract is the restoration of useful vision. This is possible only by perfect repair of the wounded tissues, normality of the refracting media, and proper reaction of the retina. An eye in which vision will be satisfactory ultimately may be delayed in its progress towards usefulness by interference in resolution, by opacity or cloudiness of one or more of the media, or by temporary functional inactivity of the long disused retina.

In the restoration of vision the chances are that success will crown the efforts of the surgeon, provided the immediate results of the operation are satisfactory. While the effect of a brilliant operation may be lost by secondary changes, or consequent disease; yet, other things being equal, the probability of success depends in a large measure upon the operation and the prevailing conditions of the first three or four days, particularly the absence of suppuration.

The Chances of Success.—With the question of operation arises the query: "What are the chances of success?" The answer to this question will be based upon the observation or the individual experience of the operator. In estimating the chances and forming a conclusion in any given case there are two sets of conditions to be studied. These relate, first, to the patient himself; and second, to his suroundings, before, during and immediately following the operation.

The general conditions unfavorably affecting the result in a cataract extraction are those which lower the power of resistance to germ invasion, infection being imminent if anything interferes with perfect closure and rapid healing of the wound.

Age.—Naturally the first consideration is the age of the patient. To my mind this is less important than his general condition. Since the infirmities of the flesh are in direct proportion to the years, it is to be expected that the chances of a successful operation are lessened in old age. However, some of the best results met are in patients past eighty. If the organs are active and the appetite and bodily vigor good, the chances of success are excellent. A test which, in advanced age, gives a

valuable hint as to the condition of the cornea and the probability of perfect closure of the wound is the elasticity of the skin over the back of the hand. Pinched up and released by its rebound the skin indicates the firmness and elasticity of the tissues. Attention was called to this little test by some writer years ago, and I wish to testify to its value as an indication of the elasticity or inelasticity of the cornea. To my mind the chances of success or failure in cataract extraction are largely influenced by the condition of this structure. If it is flabby, soft, inelastic, crumpling like wet parchment, or falling in like "heavy" cake, the lips of the wound do not coaptate, the iris is likely to prolapse, and secondary infection is liable to occur. In brief, if the tissue be firm and elastic and the bodily health good, I do not consider advanced age as detrimental to the ultimate result.

General Conditions.—The failure of a cataract extraction is not foreordained simply because the general health of the patient is impaired. Especially in chronic disease, if the circulatory organs be free from serious involvement, we may expect a good result. But any condition, acute or chronic, which affects the circulation is liable to delay the healing process and expose the patient to the danger of secondary infection. Conditions which are comparatively unimportant in grosser surgery may be of the greatest importance in weighing the chances in the cataract operation. Therefore, kidney and heart lesions, lung disease, syphilis, and, indeed, any condition which has an effect upon the circulation or blood-vessels, or upon the reparative processes, must be considered in making a prediction of the result in cataract extraction.

In diabetes, for instance, a disease which frequently has cataract as a symptom, the result must be more or less uncertain. The bad prognosis is due, not alone to the disease itself, but also to the necessary neglect of the post-operative precautions. In its proper order, the writer will speak of the value of rest in bed in the after-treatment of the cataract patient. In diabetics this change from the ordinary mode of life is dangerous. The inactivity and consequent interference with elimination may induce delirium, diabetic coma and death. That has been my experience in at least one case. Naturally the usual post-operative treatment has been modified in all diabetic patients since. While the results have been fairly satisfactory, yet it seems to me they are not as good as they would be could the usual practice be followed. In such cases iritis has been a more common complication than could be wished. In rheumatic and syphilitic patients, too, the same complications must be expected, and is likely to be much more serious than in patients free from both diatheses.

Acute conditions are of more consequence. Immediately following the operation, the patient may have a chill, the result of shock or exposure; the power of resistance to germ invasion is lowered at a critical time; infection takes place, suppuration follows, and the eye is lost from what the laity and many doctors call "taking cold." In a series of one hundred extractions during the two college years, 1900-1901 and 1901-1902, the writer had a loss from suppuration of one per cent. This patient was a "roustabout" in a livery stable; he was careless regarding personal cleanliness, wore two suits of woolen underwear, summer and winter, slept in his clothes in the hay loft, and would seem to be immune to exposure of any sort. But the bath tub, the thin night shirt and the clean bed were too much for him; a few hours after the operation he had a chill followed by high fever, and pus appeared in the wound on the second day. I honestly believe that had this patient been left in his normal dirty condition and sent to the barn after the operation, he would have made a nice recovery. In spite of every effort there is more or less pyogenic germ invasion in every case and lowered resistance from any acute systemic disturbance, or radical departure from the accustomed habits renders the wound liable to suppuration.

Local Conditions.—It were carrying coals to Newcastle to speak of the importance of local disease and its possible effect in causing infection. Previous disease of the eye, involvement of any of its parts in an inflammation, disease of the lids, lachrymal apparatus, or nasal accessory sinuses, all have a bearing upon the prognosis in cataract extraction. Even the normal eye, bathed in the normal fluids, is under constant siege by watchful bacteria; the enemy is ever ready to leap into any abrasion and to occupy the site of the smallest solution of continuity. Many forms of micro-organisms are always present in the eye. Most of them, of course, are not pyogenic, but some become so when introduced into the tissues. The staphylococcus is the most dreaded, and in one or more of its forms is ever ready to enter the wound and begin its work of pus production.

It is not claimed that by any process yet known to science harmful bacteria can be absolutely expelled from the eye without injury to the organ; however, any preparation which reduces to the minimum the number of these agents is a consummation devoutly to be wished. In a struggle for life against heartless foes it is reasonable that the chances are in direct proportion to the number of the enemy. That system, then, which eliminates the most pathogenetic bacteria is the system which,

other things being equal, will give the largest percentage of satisfactory results in cataract extraction.

The Patient's Preparation.—It is my practice to require before an extraction the same preparation of the patient which is imposed upon the subject of a capital operation where a general anæsthetic is to be given. The night before the patient is given a bath and shampoo, with thorough scrubbing of the eyebrows, forehead, nose and cheeks; the eye to be operated is irrigated with a saturated boric acid lotion, the closed eyelids, margins, brow and eyelashes are mopped with 1-5000 bichloride of mercury solution, the eye is then covered with a thick pad of gauze dipped in bichloride solution, and bandaged. Care is exercised not to manipulate the parts so much or so roughly as to abrade the surface, and, if the skin is very sensitive, the gauze pad is moistened with boric acid lotion instead of the bichloride of mercury.

This dressing is left in place until early morning. It is then removed, the eye irrigated, a one per cent. solution of atropine instilled, the surrounding parts mopped as before and the bandage replaced. No further attention is paid the eye until time for operation.

In the preparation of the patient I have never gone to such lengths as to follow the advice of Dimmer, who advocates shaving the eyebrow and clipping the lashes. In exceptional cases, however, I believe this practice is desirable. With a patient like my "roustabout," for instance, such extraordinary care in preparation is necessary to escape infection.

The Place of Operation.—It is not necessary, of course, to have access to a modern operating room in order to have success in the cataract operation. But if glass and marble are not to be had it is the part of wisdom to operate in as clean and light a place as possible; every precaution helping to exclude a chance of infection is trouble well spent. The dining room and the kitchen, previously unprepared, are not, in my opinion, suitable places for operating; neither is the bedroom where the patient has spent the night, and which, perhaps, is unaired from many nights' occupation.

My choice is to select any room, large or small, preferably one into which the sun's rays fall and which is capable of free airing, or, better still, one which may be spared long enough to disinfect. This, or a corner of it, may be transformed into a beautiful operating room by tacking clean sheets over the carpet, upon the walls and ceiling. All this may seem unnecessary, but in my opinion, when the oculist exercises the same care in the cataract operation that the modern surgeon

does in a laparotomy, the percentage of loss from suppuration will be reduced almost to nil.

Everything which touches the patient and everything which the surgeon and his assistants may touch should be previously sterilized; tables should be covered with sterilized sheets or towels, basins, irrigators, cotton, gauze, bandages, instruments, solutions, all should be sterilized. Our chances to avoid pathogenic infection are thus greatly increased. When I recall the old days when we used to dust the parlor table with the same cloth used to wipe the rust off the instruments, and yet had healing by first intention, all these details seem stupid; but comparison of results now with results in former times must convince the most skeptical that the modern way is far superior. This body is not the infant class where the alphabet of ophthalmology is taught, and yet sterilization is a vowel in the A B C's of operative ophthalmology which apparently is never uttered by some of our brethren. At the risk of boring the ninety and nine, I am after the one who has been blind to the progress of surgery, and who still neglects the aseptic precautions of the day. I believe our science should be so exact that in a series of selected cases we might predict the absence of suppuration in every single one.

The Anaesthetic.—So far as the local anæsthetic is concerned I have little to say. I always use a four per cent. solution of cocaine which is freshly prepared with sterile water and kept in a sterilized bottle. It is dropped into the eye with a surgically clean dropper and used as sparingly as posible. One, or at most two instillations, will suffice to anæsthetize the eye. For two reasons no more than just enough should be used. First, if too much cocaine is applied, the corneal epithelium dessicates and exfoliates, interfering with the transparency of that structure and the surgeon's view of the anterior chamber. Second, too freely applied the cocaine appears to soften the corneal tissue, causing its normal elasticity to be temporarily reduced to such an extent that perfect closure of the wound is not immediately possible. To avoid the first of these unnecessary complications the eye is kept closed from the moment of instillation till every preparation for the operation has been completed. Evaporation and consequent dryness of the cornea are thus avoided and a smaller amount of the cocaine is required. To escape the second, the anæsthetic is not used until just before the last details of preparation have been made. Should the eye be unusually congested from any cause, or the sclera not blanch out perfectly white, a single drop of adrenalin will complete the anæsthesia;

until the blood-vessels disappear from view the anæsthesia is not complete. In a normal eye two or three minutes is quite enough time to elapse between the first instillation of the anæsthetic and the beginning of the operation.

The Operator and His Instruments.—Once more I desire to pose as a critic. [What a joy it is to take this "holier than thou" stand, and to lecture the craft. Forgive me, brethren.] The cataract operation is so quickly done that to roll up one's sleeves, scrub the arms and hands, clean the finger nails, scrub again, soak the hands in an antiseptic solution and rinse them in sterile water, seems like much trouble; furthermore to dress in a sterile gown and to rewash the hands just to spend two minutes at an operation seems almost foolish. But this is no small part of the price of the highest score in successes.

The instruments must be boiled also, if every avenue of germ invasion is to be guarded. To dip the instruments in an antiseptic is not sufficient, but actual boiling for several minutes is a necessity. The knife, placed in a little metal rack, will pass through this ceremony unimpaired. To the usual instruments it is my recent practice to add a hypodermic syringe of such style of manufacture as to render it capable of perfect sterilization. Its use and that of the flask of sterile normal salt solution which goes with it will be considered later.

The Last Touches Before Incision.—The eye is anæsthetized, the surgeon and his instruments are ready. The brow, eyelids and immediate surroundings are once more carefully mopped, and the eye freely irrigated with the boric lotion. The speculum is inserted, the patient's head, including all parts of the face except the field of operation, is covered with sterile towels.

The Operation.—It is not my purpose to insist upon any special style or method of operation. That, of course, is a matter for individual selection. I have my own preference, of course, but the object of this paper is to present the views of its author on such features of the cataract extraction as make for its success or failure. The manner of the incision, whether the operation is modified or simple, and the particular kind of instruments used have no bearing on the question.

The Cystotomy.—There is one step in the technique, however, which is worthy of more than passing notice. That is the capsulotomy. In my opinion it should be peripheral. Even in our own society this is not a new idea. We discussed it five or six yeares ago. However, some recent experiments of my own have convinced me that the peripheral cystotomy is preferable. About a year ago several extractions were not

entirely satisfactory as to visual results. Capsular opacity was at fault, and with a view to a better pupil, the experiment was tried of making a more central and crucial cystotomy. Irido-capsular adhesions and prolonged iritis occurred in every case. Special effort since to open the capsule at its periphery has proven eminently satisfactory in the absence of adhesions and iritic irritation.

Some years ago Mr. Morton, at the Moorfield's Hospital, was making the peripheral capsulotomy with the linear knife instead of the cystotome. In a few cases, where I imitated him, the results were good. The capsular opening was clean cut, any soft matter left remained within the capsule, no iritic adhesions occurred, and subsequent iritis was insignificant. But one or two experiences with a dense anterior capsular after-cataract made me wish I had opened the capsule more freely, so that in its parchment-like rolling back, the pupil would have remained free and unobstructed. But for reasons already given I believe the peripheral cystotomy is preferable.

Prolapse of the Vitreous.—Every operator, I suppose, has one particular dread. Prolapse of the vitreous is mine. After taking every pains to save an eye, it is disappointing to see a great quantity of vitreous flooding the wound and field of operation. A small amount of loss is of no consequence in itself. However, the wound is kept open, and the chance of secondary infection increased by this accident. But the operator of experience has been fortunate, indeed, who has not seen an eye from loss of vitreous collapse like an airless foot ball.

Many months ago a writer in the Archives of Ophthalmology said he should try an injection of normal salt solution in his next case of this kind. Last year I had the misfortune to meet such an emergency. Immediately upon the corneal section vitreous appeared in the wound. I did not dare to make any pressure upon the cornea, so immediately delivered the lens with the loop. Fully two-thirds of the vitreous body escaped, and the eyeball collapsed. It looked like a dismal failure. The idea of the Archives writer came to mind and the sterile normal salt solution was slowly and carefully injected into the dilapidated organ. The eyeball gradually took shape, the iris floated into place, the cornea lifted up, and the wrecked orb was apparently none the worse for its disaster. Healing was uninterrupted, and after more than a year's time the good result is unimpaired. A few experiences since in cases much less serious have been satisfactory.

The Dressing and Post-Operative Treatment.—In the after-treatment of the patient there is another chance for difference of

opinion. I remember the positive statement of one of our honored members to the effect that it makes no difference in the recovery whether the patient is with or without bandage, in or out of the light, in bed or not. That testimony may be reliable and safe to follow, but I prefer to bandage the eye very carefully, first applying a round of sterile gauze and just filling the orbit with cotton. The unoperated eye is also covered. The patient is then removed to his room, and keeping the recumbent position, lifted into bed. The room, if I may choose, is large, airy and sunny, but above all else, well ventilated. The chance of secondary infection is much less in such a place than in a crowded ward with air poisoned by the exhalations of a multitude, or even of a few sick people and the attendant nurses.

It may not appear to every operator, but it is my practice to keep the patient upon his back, or carefuly turned from side to side, for three or four days. Prolapse of the iris, so common in the experience of some, is, in my opinion, due to neglect of this precaution. A patient given unlimited freedom after the first day will usually abuse it. He sits up, reaches over the side of the bed, and by some sudden wrench of the body or closure of the eyelids breaks open the wound. Of course, the iris prolapses. On the other hand, if the patient is impressed from the beginning with the danger of movement and the necessity of perfect quiet, this possibility is avoided. This precaution may be a work of supererogation, but it appeals to me as sensible.

Unless rise of temperature, displacement of the dressings, or some unusual cause make it seem necessary, the first redressing is made at the end of forty-eight hours. The surgeon's hands, the dressings, the solutions are all prepared as carefully as at the time of the operation. The bandage is removed, the brow, eyelids and surrounding parts are carefully cleansed with the bichloride, the eyelashes mopped, and, finally, the eye examined. These precautions are perhaps unnecessary in most cases, but should the wound be unclosed and "leaky" from any cause, there is almost as much danger of infection as at the time of extraction. An excess of caution is a good thing in a surgeon.

If everything is all right a drop of sterile atropine is instilled and the eye redressed. After the first time the dressing is made daily. In an uncomplicated case the patient is permitted to sit up in bed on the fourth day, and to be dressed on the fifth. Should iritis ensue a little longer time in bed is the usual prescription. Otherwise the patient is out of doors in ten days, and quite himself at the end of two weeks.

CONCLUSION.—In my opinion it is attention to such details as these

here discussed which makes for the success of the cataract extraction. My listeners may not agree with me, but for my part, if I had cataract and chose the operator, I would select one who scrupulously follows the new surgery, in preference to another who, careless of aseptic precautions, possesses greater brilliancy in manual dexterity.

DISCUSSION.

Harold Wilson, M. D.: Such an excellent paper as that of Dr. Copeland's contains very little to which general assent may not be given. The practice of individual surgeons differs, and probably always will differ in respect of certain details of the operation for cataract. These differences arise in part from theoretical opinions, in part from practical experiences, and in part from accidental habits. We adopt particular methods of procedure; possibly from some chance reason we become expert in their employment, and naturally hesitate to change.

Upon theoretical grounds, the preliminary occlusive bandage, however sterile, does not commend itself to me. I think there is no doubt that the closure and immobilization of the eyelids under a bandage of itself favors the multiplication of bacteria upon the conjunctival surface. This is a very common observation in practice, and although I shall not dispute the results obtained by this method, I should not wish to adopt it. I do not believe that we can be too stringent in the employment of rational antisepsis, but it is possible to do much that is useless, and some things that are positively harmful. It has been pretty well established by careful experiments that bactericidal solutions used in the eye in strength sufficient to destroy micro-organisms during the brief time they can be in contact with them really render the tissues less resistant to invasion from those which inevitably remain. I do not know that the use of the "boric solution" is at all irritating, but it seems to me that there are good reasons for preferring a sterile normal salt solution. Everything coming directly or indirectly in contact with the wound should unquestionably be made and kept as sterile as possible, but the operator's hands certainly need no such scrupulous attention as would be required for an abdominal operation. I doubt if most of us are so much afraid of infection proceeding from the walls and floor of the room that we carefully cover them with clean sheets. In the matter of after-treatment I have always been pleased with the use of the silk isinglass plaster strip for immobilizing the lids, supplemented when necessary with a light bandage. Moreover, it is very comfortable for the patient. Three or four days upon the back is a rather long purgatory, although it is possible some patients may require it.

Chas. H. Helfrich, M. D.: My early experience while resident surgeon of the New York Ophthalmic Hospital taught me the value of strict asepsis in cataract operations, and I am in sympathy with the sentiments expressed by Dr. Copeland in his paper. During the first year of my term, sixteen years ago, the aseptic precautions employed there, while

being abreast of the times, seem very crude now, and no doubt accounts for the two cases of suppuration we had out of the twenty-four operated upon. In the succeeding years with the improvement in the measures employed there was a marked decrease in the number of cases of suppuration, though the number of cases operated upon was doubled and trebled. This was very striking during the last three years of my incumbency, when only one case was lost through suppuration out of about three hundred operated. Such results are all the more gratifying if we take into account the number of operators who performed the operations.

I hardly believe anyone would hazard an operation nowadays without following out strict aseptic conditions.

Personally, I have never had a case in which the loss of vitreous was great enough to require the injection of a sterile normal salt solution. It certainly is a rapid and rational method of filling up the gap, though the eye of itself will accomplish the same purpose through the secretion of the natural aqueous humor. This was illustrated in a case of the late Dr. Geo. S. Norton. Directly after the completion of the incision the patient suddenly shut down on the speculum, forcing out practically all the vitreous but leaving the lens behind. The loss of vitreous was so complete that the eyeball became wrinkled. After waiting half an hour the aqueous had formed in sufficient quantity to cause the eyeball to resume its natural shape, when the lens was easily extracted with the scoop. Before bandaging the eyeball was allowed to fill up with aqueous again, when it was seen that the lips of the wound were correctly coaptated. The patient made a good recovery. Time might be saved in such a case by injecting the sterile normal solution where composition so closely resembles the aqueous humor.

In regard to diabetic cases I have not quite the horror of them that Dr. Copeland expresses in his paper. It is true that the visual results, even though the wound heals kindly, are not always all that could be desired, especially if retinal complications exist, but some of the cases show good results.

I prefer the central crucial capsulotomy because I believe it lessens the necessity of a secondary operation. Dr. Knapp, the principal exponent of the peripheral capsulotomy, adopts it because he thinks there is less reaction, and as he considers a discission necessary in nearly all the cases, he feels he has lost no advantage. I am not convinced that the reaction is any less by this method, and my experience with the crucial is that secondary operations are very often unnecessary, providing one is willing to wait a reasonable time for the cortical matter to be absorbed. I called attention to this point in a paper presented to this society last year.

W. B. Kreider, M. D.: The essayist has given us an excellent paper, and emphasizes a salient feature in modern surgery, namely, thorough aseptic preparation, whether it be the work of a few moments, as in an uncomplicated cataract extraction, or something requiring hours to accomplish.

We may not all be blessed with a delicate touch or exquisite technique as is exercised in brilliant manual dexterity. These are gifts that are natural to some, like the born orator who can display true eloquence, or the gifted musician who has the soul of rhythm and time at his finger's end. Manual dexterity can in a certain sense be held in obeisance to a cultured mind, moderate physical culture and proper living. The operator possessed with these gifts, combined with order and personal cleanliness, stands pre-eminently at the head of the list, and such a one would enter the details of the perfect aseptic preparation of the patient and not think such time spent in vain.

The results of the essayist in a series of operations are approaching the ideal. These I believe to be due to the painstaking details in the preparation of the patient, and every step of the operation. Some of us take issue from the essayist in the care of the patient immediately after the operation, allowing more freedom of action and avoiding the close confinement, which so often frets the aged, and in the matter of a bandage, which, after all, seems only a precautionary method. and is not open to criticism but rather to personal emulation, as the welfare of the patient is kept uppermost in the mind of the conscientious surgeon.

The essayist says the end to be accomplished by an operation for cataract is the restoration of useful vision. I believe the restoration of the best vision for the patient in about $^1/_8$ of the cases invites a secondary operation after peripheral capsulotomy, owing to the density and loss of translucency of the capsule in about this per cent. of cases.

In regard to the general conditions of the patient, we are sometimes surprised at the reparative process of nature in an impoverished and run down condition of the system, as exemplified in a case of tuberculosis pulmonaris. I was called on to operate for cataract. The case in question was one of double senile cataract, unusually early in life, the patient then being only 26 years old, and had been blind for over a year. The operation was the usual upward section with immediate iridectomy. The operation was uncomplicated and left a clear pupil. The healing of the corneal wound was by first intention, and in ten days' time the patient was permitted to use the eye. The early use of vision was permissible to fit the expediency of the operation, which, however, was done under protest, as the young lady begged for the operation so as to be permitted to see her mother before she died. The young patient died of pulmonary consumption within sixty days after the operation; the operated eye remaining comfortable with useful vision. This case may be an isolated one without reference to create a precedent, but the fact remains that this case was successfully operated on for cataract while in the last stages of pulmonary consumption, and we may add that chronic lung trouble is not necessarily to be placed on the prescribed list of physical conditions negative to results in cataract extraction.

The essayist leads us clear cut through the various stages of a cataract operation, and to discuss farther would be to reiterate established principles.

E. J. Bissel, M. D.: The subject of cataract is one we can talk on all

day and then leave many unsettled questions. I do not know that the last word has been said upon cataract extraction as yet, but it is well to have the subject brought up from time to time and ventilated, and especially the methods used in successful cases. Men differ quite a little in their methods; almost every operator has certain peculiarities of technique, and yet when we come to analyze the work and compute the results, we find that there is not such a wide difference in results. I do not have the great experience and large opportunities that those do who live in large cities with large hospitals and clinics. I have had about seven hundred cases, which is a goodly number for my section of the country, and the longer I operate and the more experience that I have the more I am convinced that we cannot compute the results beforehand.

I have had some sad experiences in which I have been tripped up on the very cases that I had flattered myself that I was going to get an ideal result, and I have sometimes been surprised by success where I could promise but little. We cannot tell absolutely how a given case is going to come out. In regard to diabetic cases I have had a varied experience, some giving as good results as I ever had in my life, some not so good, but none dying.

No matter what the case the prognosis should be guarded unless you can see the fundus. If you can see the fundus you can give a fairly intelligent prognosis, but when you are unable to make out the condition of the fundus you are all in the dark, and can give but a guess at best. The prognosis depends many times upon the retinal complications. A man in apparently the best physical condition came to me; he was six feet high, well built and of healthy appearance. It turned out that he was troubled with cataract. On examination, however, I found that there was two per cent. of sugar in urine. He wants me to operate as soon as I return. My prognosis is based not so much upon the fine physical condition as upon the condition of the retina, which seems to be in fair condition. I believe that there is reasonable hope of success.

I have practically drawn the line at operating at the patient's house. I can generally win them over to a right view of the subject by saying, "There are good hospitals now always available, the prospects there are better than at your house, no matter how perfect the arrangements, so that if you want my services you will have to go to a hospital." I will not operate in a private house any longer. People from the country less better informed on the subject have the most prejudice, but I generally manage them by telling them that their chances of restoration are much better if they will go to a hospital.

One cause of suppuration and the most frequent one is due to infection through the lachrymal gland and duct, so much so that I now generally take the additional precaution of disinfecting the nasal cavities with antiseptic solutions, and, if there is the least sign of the tear sac being catarrhal or inflamed, I give quite a preliminary course of treatment, cleansing the puncta, and, if necessary, extirpating the sac completely. It is a wise precaution to thoroughly disinfect the nose. I have

had infection from these sources when the trouble was very obvious, the parts appearing in good condition upon a superficial examination.

In regard to the use of cocaine, the essayist says that he uses four per cent. solutions; for simple extraction I believe that two per cent. is better; there is less irritation and the eye does better. When an iridectomy has to be performed I also use a four per cent. solution. Prolapse of the vitreous has ceased to be a bugbear to me. I have had two cases, one slight and one extensive. Prolapse of the iris will be a rare accident with the precautions spoken of by the author unless from a pure accident. One man convalescent, and just out from the hospital, struck his eye against a twig of a tree. A cataract operation had been performed and the eye was not perfectly strong yet. A prolapse of the iris followed as a result, but he got on all right. I have come more and more to let cases of prolapse alone. I do not recollect a case of prolapse except this one for the last two years. In regard to the management of an operation, I have a mattress cleaned and sterilized, and taken to the table of the operating room. After the operation the patient is transferred right to the mattress and then to the bed, where they are to lie. That prevents all risk of strain, and is, I believe, one element in avoiding accidents and complications of this kind.

A. B. Norton, M. D.: There are two points in Dr. Copeland's paper upon which I wish to say a word. First, as to the dressing. It is my practice to apply a gauze wet in bichloride, and over this a thin layer of absorbent cotton, cut the right size, and soaked in the bichloride. The solution is not pressed out, the wet cotton is allowed to shape itself to the eyeball, which it does by its own weight, over this one or two layers of dry cotton are lightly laid, and the whole held in place by two narrow strips of adhesive plaster. This dresing is light, firm and makes no pressure on the eyeball—simply holds the lids in place. The eye dressed as described, is left unopened until the third or fourth day with no fear as to the condition underneath. Secondly, the routine use of atropine in cataract cases seems to me unwise. Since returning to the combined operation, with a preliminary iridectomy, many of my cataract cases never receive a drop of atropine from beginning to end. Atropine is only used when iritis is present, but with this operation and dressing I see much less iritis than formerly, and due, I believe, to the preliminary iridectomy, and to the light, smooth and uniform dressing.

C. H. Hubbard, M. D.: I wish to say a word about the use of cocaine. I think that if you were to use holocaine in place of it you would have very little to complain about. I spent several weeks with Dr. Knapp during last winter, and I noticed that he uses holocaine to the exclusion of cocaine, so that the unpleasant effects of the latter are avoided.

R. S. Copeland, M. D.: I hope I have not conveyed the impression that every diabetic patient that I ever operated upon for cataract died, or that all the bad results in my specialty have been diabetic cases. In my opinion not all cataracts in diabetics are diabetic cataracts. Cataracts may co-exist with sugar in the urine and yet depend upon other causes

than that for their existence, so that we should be on our guard and not jump to the conclusion that the diabetes is the cause of the trouble. It may be so, it is very apt to be so, but it is not necessarily so.

My preference is for the peripheral capsulotomy for the reasons stated in the paper. The curve of the lance in the latter operation is such that it is much less likely to come into contact with the iris, and hence adhesions are less liable to come up as complications. To avoid the irido-capsular adhesions I have a preference for the peripheral operation.

E. J. Bissell, M. D.: Is not prolapse of the vitreous more apt to occur in the peripheral operation as an offset to its advantages?

R. S. Copeland, M. D.: I have never had but one case of serious prolapse of the vitreous; that I described last year. Perhaps one-half of my cases are done by simple extraction. I have done that operation more frequently than before, and in view of my present practice and use of that operation, I am somewhat ashamed of my recorded remarks in former years. As regards the after-treatment, it is true that you may turn many cases loose shortly after the operation without bad results, but still I do not regard that as an ideal way. I sent one patient to the ward after the operation, and later could not find him for some time. He finally turned up in the smoking room, sitting tipped up against the wall and smoking his pipe, and yet he made a good recovery. It is undoubtedly true that cases are followed by suppuration that many times are due to the fault of the surgeon. If the same care was taken in preparing the patient that is usually taken before an abdominal operation, suppuration would be a very rare event, not forgetting the instruments and the surgeon's hands.

OSSICULECTOMY FOR CHRONIC SUPPURATIVE DISEASES OF THE EAR.

BY ELMER JEFFERSON BISSELL, M. D.,

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CHRONIC suppuration is too general a term to meet the needs of modern otology. In the light of our present knowledge it lacks those specific elements which should entitle it to be retained longer as the name of a disease.

It is only a symptom, varying greatly in character, coming from different localities within the ear and kept up by a variety of pathological conditions.

Our literature is full of therapeutic agents recommended without discrimination for "chronic suppuration" of the ear. This lack of differentiation is confusing and leads to frequent and unnecessary failures in their application.

A more definite and self-explanatory nomenclature is needed, and would do much to obviate this confusion. Diverse as are the conditions in chronic discharging ears, nevertheless a fairly accurate and yet limited classification of cases can be made. In our ophthalmic work we use the term iritis, keratitis and their combination kerato-iritis; similarly on a pathologico-anatomical basis the following nomenclature would seem to be in harmony with clinical facts, and I offer it as a suggestion toward precision in our aural work:

1. Simple chronic suppurative tympanitis.
2. Chronic suppurative tubo-tympanitis.
3. Chronic supurative epitympanitis.
4. Chronic suppurative mastoido-epitympanitis.

Other combinations may be used, but most cases can be classed under these four heads.

To every otologist the mere mention of anyone of these names suggests a fairly constant group of symptoms. I will very briefly review them, as they lend themselves to the distinctions I wish to make in outlining the sphere of ossiculectomy in diseases of the ear characterized by chronic suppuration.

Simple Chronic Suppurative Tympanitis.—In this disease the perforation involves more or less of the lower two-thirds of the mem-

brane. The discharge is a mixture of serum, mucus and pus, rarely offensive, moderate in amount, and is prone to recur after it has ceased for a time. The walls of the tympanum look red and velvety, and dent slightly under contact with the probe. Large masses of granulations are occasionally present, and in rare instances there is necrosis of the bone. In my experience it is generally at the floor of the cavity, and in such cases the discharge is apt to be scanty and offensive.

Surely no one would contend that ossiculectomy is necessary or would expedite a cure in this disease. Therefore, by a process of exclusion, I pass it by without further consideration.

Chronic Suppurative Tubo-Tympanitis.—This disease has much in common with the one just described, but the inflammation of the Eustachian tube is so markedly a characteristic of some cases in which there is a chronic suppurative tympanitis that they may well have a separate name. The discharge from the tubes is a stringy, ropy, non-offensive mucus, usually quite colorless and not easily dislodged. The pharyngeal end of the tube is apt to be narrow and the tympanic opening large. Not infrequently these cases are associated with naso-pharyngeal adenoids.

It is very important to distinguish tubo-tympanitis from chronic suppurative tympanitis, as the treatment must be radically different if a cure is to be obtained. It is beyond the scope of this paper to consider the treatment other than to say that in this, as in the former disease, ossiculectomy is rarely, if ever, indicated.

Chronic Suppurative Epitympanitis.—Rarely in this disease is there no inflammation of the tympanum, but the pathological changes within the attic are so characteristic and vitally important from a therapeutic point of view that the term, chronic suppurative epitympanitis, seems to most clearly define the essential nature and principle location of the disease. There may be partial or complete destruction of the tympanic membrane, or it may be intact with only a perforation in the pars flaccida. Frequently when this latter condition exists the tympanic membrane is adherent to the inner wall of the tympanum. The discharge is prone to be markedly purulent and offensive, but not copious. Often is it cheesy or mixed with whitish epithelial scales and masses, indicating a tendency to cholesteatoma. Small bunches of granulations frequently present at the perforation, and the delicate use of a probe clearly reveals that they have their origin in the epitympanum, and further use of the probe will usually detect necrosis of the ossicles or walls.

Much more could be written regarding this disease and its many manifestations, but enough has been outlined to serve my purpose.

At the head of therapeutic agents for this disease I place the removal of any remaining tympanic membrane, together with the malleus and incus. If we consider the well-known clinical history of this disease, the anatomical peculiarities of the region involved, and the universally accepted surgical principle that any pus-producing cavity should be rendered as accessible as possible for purposes of drainage and cleansing, then ossiculectomy would seem to be indicated in a large majority of cases of chronic suppurative epitympanitis. I readily admit that now and then a case will be cured by non-surgical measures, and I see no objection to following such a conservative course in all cases for a limited time, providing the patients are informed as to the surgical probabilities. Further consideration of the operation I wish to defer until I have described the fourth class of cases.

Chronic Suppurative Mastoido-Epitympanitis.—Impossible as it is to always determine whether the antrum and other portions of the mastoid are but slightly involved, nevertheless there are cases in which there is no doubt as to the serious extension of the pathological process into the mastoid.

The size and location of the perforation may be the same as in the previous disease, or what is more characteristic, a sinus may be found through the bone posterior to the tympanic membrane. Larger masses of cholesteatoma may be worked out than in epitympanitis, and not uncommonly I have found it possible so to manipulate a bent probe as to positively determine that granulations, cholesteatoma or necrosis existed within the mastoid.

When a positive diagnosis of chronic suppurative mastoido-epitympanitis can be made, I have very little confidence in the efficiency of ossiculectomy. It is my experience that nothing short of a radical operation will give a reasonable hope of a cure.

According to the classification I have made I would, therefore, with rare exceptions limit the sphere of ossiculectomy to the third group of cases, and this I must somewhat further consider.

I have already hinted at the difficulty in some cases of chronic suppurative epitympanitis of determining to what extent the mastoid is involved, and it is against these doubtful cases that the failures of ossiculectomy must be largely charged. It is also regarding these cases that there should be any difference of opinion whether ossiculectomy or the radical operation should be selected. If a conservative treatment is

followed for a short time in all cases it permits the aurist to become familiar with all elements of his cases, and a differential diagnosis between chronic suppurative epitympanitis and mastoido-epitympanitis can, with the rarest exceptions, be made. If this course is followed and ossiculectomy is done for chronic suppurative epitympanitis and the radical operation for mastoido-epitympanitis, very few failures will result, certainly no more failures from ossiculectomy to cure the discharge than attend the radical operation.

If in doubt, ossiculectomy has the advantage of being simple and less dangerous. It removes much of the diseased structure, facilitates drainage, gives freer access to the attic for cleansing and application of remedies, and oftimes improves the hearing.

DISCUSSION.

Geo. W. McDowell, M. D.: The application of distinctive names to suppuration affecting different parts of the tympanum, as expressed by Dr. Bissell, certainly tends to increased accuracy in making a diagnosis and greater certainty in the prognosis. In the first two forms, those affecting the atrium and the Eustachian tube, the influence of the ossicles on the course of the suppuration, is manifestly very small, and may be considered negligible.

In the third form, chronic suppurative epitympanitis, the ossicles play a very important part. The attic, which is the space involved in this variety of inflammation, is so arranged that the head of the hammer and the body of the anvil largely fill its cavity, while the fibres which hold these bones in position form a net-work of tissue which constitutes the floor of the space, with but few intervening openings in its meshes. We have then a cavity nearly closed at its most dependent portion, making it especially unfavorable for drainage and inaccessible both for examination and treatment.

Suppuration in this part gives rise to caries of the ossicles contained within it, especially the anvil, because of the latter's poor blood supply. Periostitis and caries of the walls of the cavity also occur.

When a periostitis can be localized and is open to instrumentation, curetting is our surest method of cure. This cannot be always used in suppuration in the attic, because of the difficulty of applying the instrument to the actual site of the disease, both from our inability to see the part affected, and the smallness of the aperature through which the work must be done. Some cases, indeed, respond to injections through the opening into the attic of such solutions as enzymol, or applications of aromatic sulphuric acid on a probe carried into the cavity. But these are hit or miss methods with no certainty as to results. The only satisfactory and thoroughly surgical method is the one cited by Dr. Bissell, or, going a step further, removing the lateral wall of the attic, together with the ossicles, making the Stacke operation.

To differentiate absolutely between a suppurative process confined to the attic and one also involving the mastoid is, I believe, impossible. When the discharge is not profuse the chances are that it arises from the attic solely. But when the discharge is very profuse, and can be seen coming from the opening of the attic, we are likely to be disappointed in expecting a cure by ossiculectomy alone. In such a case the radical operation should be the one chosen. The more carefully we study our cases and the less haste we make, within reasonable limits, in deciding as to whether an ossiculectomy or a radical operation is to be made, the less likely are we to be disappointed in the results obtained. When in doubt as to which operation should be performed, ossiculectomy should be chosen as being the simpler and affording a possibility of cure. If this fail to make a cure, the radical operation can always be performed as a last resort.

F. W. Colburn, M. D.: There were a few points in the doctor's admirable and valuable paper which particularly interested me. The suggestions toward the improvement in the nomenclature are well worth consideration and discussion. The divisions as proposed by the doctor enable us to express an accurate diagnosis, where we have been covering these several divisions by the one term, middle ear suppuration. These give an accurate idea of the exact location of the diseased process. The operation for the removal of the ossicles is limited, in my mind, to cases included in the third division of the author, *i. e.*, chronic suppurative epitympanitis. The difficulty seems to be in making an absolute diagnosis of epitympanitis, excluding the antrum entirely. If such a diagnosis can be made with surety, ossiculectomy is the proper procedure; if not, I consider the radical operation preferable.

All operations are regarded with about the same aversion by our patients, and unless we can promise something pretty definite in the way of improvement, they are apt to shrink from it. I have found that my patients preferred the radical operation because it promised the greater hope of relief.

C. H. Helfrich, M. D.: I wish to endorse Dr. Bissell's efforts to improve the nomenclature of chronic suppuration of the middle ear and to suggest that similar efforts be made in regard to acute suppuration of the middle ear.

I cannot say that I have been very successful in stopping the discharge by removing the ossicles even when the cases have been selected as Dr. Bissell suggests. The failures, of course, are due to a more extensive trouble than was anticipated, as it is not always possible to make the refined diagnosis called for by Dr. Bissell's nomenclature. I have generally followed Grunert's advice to secure consent to extend the operation if after the removal of the ossicles is found to extend to the antrum. This saves the patient from undergoing two operations.

H. P. Bellows, M. D.: I wish to express my admiration for this very concise and thorough paper. In the classifiication of diseases of the ear we have had a great deal that is unsatisfactory and confusing; there is a chance for a great deal of improvement in that direction. The

schema of the essayist seems to me to be a good one and worthy of careful consideration.

I confess that when the doctor had finished his remarks about ossiculectomy I was both pleased and disappointed; pleased because I found that I was personally not behind the times as much as I might have found myself, and disappointed because the doctor did not have anything new and different to offer that I might learn from him. Certainly ossiculectomy is not worth much discussion as a remedial measure in catarrhal disease of the ear. In regard to the advisability of operating or not operating in suppurative cases we cannot formulate general rules, for things a little out of the ordinary occurring in a case might determine our conclusion as to the wisdom or undesirability of operating. I have a case in point. The patient came to me after having had a series of treatments from another aurist. There was a small perforation leading up into the attic, and, of course, some discharge, and it seemed as if nothing but a thorough removal of the ossicles would be of service. But there was present an unusual degree of hearing in that case. This rather remarkable degree of hearing developed after enlarging the opening and cleansing the ear with peroxide of hydrogen. It came up to $^{30}/_{40}$ or $^{35}/_{40}$ of normal. Now, if the ossiculectomy was performed ever so successfully, there is no hope of his hearing being nearly so good as that, so I keep on stretching the opening every time he comes to see me, and continuing the local cleansing and disinfection. The odor is gradually getting less and less. I notice a difference every time that the boy comes in, and I am satisfied that no operation of the kind under consideration could have achieved anything like as good results. The applications used are dioxide of hydrogen and a saturated solution of boric acid in alcohol. This case is a little unusual, of course, but it has a bearing upon the point of our decision as to the advisability of operating or not operating in a given case.

H. S. Weaver, M. D.: I would like to say a word about the peroxide of hydrogen. I have used it a great deal in times past, but for about a year I have completely discarded it in favor of enzymol. I have been afraid to use the peroxide on account of the lack of free drainage, for where I have used it I have had mastoid involvement follow. I could give no other reason for the complication except that the peroxide had extended the trouble to other regions.

R. S. Copeland, M. D.: I am glad to endorse the idea that Dr. Weaver has put forth. I think that the peroxide is a dangerous preparation to use in middle ear troubles. The active effervescence when it comes in contact with pus carries the pus to other remote parts and deeper regions and extends the infection. Instead of the peroxide I have been using benzol. It is cleansing, it does not mummify the tissues, it does not effervesce. I also have used the digestive ferments, and think that they serve an excellent purpose. With these preparations I get along very well without the dangerous peroxide of hydrogen. I am glad to hear of any effort looking towards a more accurate nomenclature.

H. D. Schenck, M. D.: I have used enzymol for four or five years in middle ear suppurative conditions, and have been disappointed in its effect. It is not claimed that it has any particular effect upon necrotic tissue except possibly upon the pus in keeping it clean. It has no effect upon necrotic bone, does not cause scales to come off, or anything like that.

George Rhoads, M. D.: I usually perform the Stacke operation to cure such cases. I would like to ask Dr. Bissell just how he removes the bones.

E. J. Bissell, M. D.: I thank the members for taking so kindly to my rough draft of an improved nomenclature. I am glad if I have succeeded in stirring up some sentiment looking towards an improvement in the nomenclature in aural diseases. The loose way in which aural conditions are referred to in our journals is repulsive to me; my attempt towards reform is somewhat crude and applies to only one small part of the subject; work needs to be done in the whole field, and I hope that some one qualified will go on and correct the whole range of diseases of the ear. In regard to operations my paper was limited to a consideration of simple ossiculectomy performed through the canal. The question of other operation as the radical one, it had nothing to do with, except so far as they bore upon diagnosis. In answer to Dr. Rhoads's question, I cannot go into the details of the removal of the ossicles at this time. The best way is to get your specimens and taking your text books get up thoroughly on the anatomy of the parts.

If you know your anatomy well and are bold with the probe you will not have much difficulty in getting hold of the incus. It is true that we cannot always discriminate between epitympanitis suppurative and trouble involving other parts, but it is not a just criticism to depreciate ossiculectomy for the reason that the trouble may return, for that may happen after the radical operation as well. Just before I left home yesterday a lady came to me who had had the ossicles removed two years ago, with pain and tenderness over the mastoid region. I did not feel safe in leaving her, and referred her to another aurist; such a return may occur as well after the radical operation, and is not against the procedure at all. It is a wise thing in such cases to say that the operation or treatment will remove them and not to say that we are going to cure them. To say cure creates a misconception of what we are capable of doing in such cases.

I have used enzymol a great deal almost to the exclusion of the peroxide. It should not be used in the same way that the peroxide is used at all, and that may have given rise to some disappointments in its effects. It should be left in the ear and not all wiped away or washed out as we do with the peroxide. After it is applied the surfaces should be left wet with it. In that way I think you get the full action of the preparation.

H. D. Schenck, M. D.: If I may be allowed a few words more, I think that it is almost universally accepted that the results are more favorable in ossiculectomy than in the radical operation. I do not

know that an accurate comparison between the two has been made, but certainly that is my opinion. In many cases after ossiculectomy the patient will come back and say that their head is ever so much better. Perhaps they have hardly been conscious of the condition that they are in, and after the operation will find a surprising improvement. Personally, I feel convinced of the superiority of this operation over the radical one.

THE EARLY DIAGNOSIS AND TREATMENT OF TUBERCULOSIS OF THE LARYNX.

BY HERBERT W. HOYT, M. D.,

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THE early diagnosis of tuberculosis depends largely upon the technical skill of the examiner and his power of discrimination. This applies to any part of the body, but very particularly to tuberculosis of the larynx.

The larynx seems to be an organ of vague structure to many practitioners, and a slight irregularity in its contour, whether pathological or congenital, is not readily perceived.

In preparing material for this paper letters were sent to the members of this society who were classed in the directory as doing throat work, asking for personal experience with tuberculosis of the larynx. Those who kindly responded will please consider themselves heartily thanked. Some replied that they referred cases of this character to one devoting more especial attention to the throat. One said: "My experience will help to prove the hopelessness of the case, which is what I presume you are starting to do."

The records of this disease, though still very unsatisfactory, seem to give more hope during the last few years in the hands of those who have taken active measures in treating it. Usually the patients presented for examination or treatment are so well advanced in pulmonary trouble that to offer any hope of cure is well-nigh useless.

When the laity are sufficiently impressed with the importance of a laryngeal examination in case of any prolonged throat trouble, and the general practitioner will fit himself to make an examination of the larynx, it will be possible to detect more cases of tuberculosis in the early stage, when there is some hope of rendering aid.

Morell Mackenzie found that 30 per cent. of the cases of pulmonary phthisis also had tuberculosis of the larynx. Heinze, of the Leipzig Pathological Institute, in 1226 post mortems on consumptives, found 50.3 per cent. had tuberculosis of the larynx. Another, in twenty-one tuberculosis cadavers, found thirteen with the same disease in the

lymphoid ring but not all macroscopical. Whether or not primary tubercular deposits are found in the larynx has aroused long and heated arguments. Except for the two cases of Orth and Demme there has scarcely been sufficient evidence to warrant the disease as ever being primary.

Friedrich says: "We cannot admit as proof of primary laryngeal disease cases in which the lungs are found to be affected at the necropsy, even when we find the assertion that the lung disease is of more recent origin than the laryngeal affection." Mackenzie says: "As far as experience goes it is invariably preceded by a similar disease of the lungs." Heinze found no case of laryngeal phthisis without lung involvement. The post mortem table is the only means of knowing whether the lungs are free from tuberculosis.

In the replies from the members of this society 1,100 cases of laryngeal tuberculosis were reported, with seventeen suposedly primary. None of these cases was verified by post mortem examination, and with the vast experience of the pathologists it is very doubtful if one would stand the crucical test. The writer has had a number of laryngeal cases in which careful physicians have said "the lungs are all right," but in none has he failed to find foci of disease in one or both lungs.

The source of infection, whether through the mucous membrane or through the lymphatics, is another question over which debates are still held, and both sides seem to have good and convincing arguments. But is it necessary that any disease should be contracted through one channel to the exclusion of all others? Often early deposits of tubercles in the mucosa under an apparently perfectly healthy membrane are seen and the bacilli are more abundant, deeper in the nodule than nearer the surface. There is in such cases very little change in the surface of the mucous membrane until breaking down of the tubercle takes place. Lake claims that the route of the lymphatics is so circuitous from the lungs to the larynx that it is not reasonable to think of the infection being caused in that manner, and favors the theory of absorption directly from the sputum through the mucous membrane.

It is well known that the tonsils and base of the tongue are very absorptive, and in close relation by the lymphatic ducts with the larynx. This source of infection seems much more reasonable than that the bacilli are absorbed through an unbroken mucous membrane; at the same time constant or severe coughing might easily abrade the surface of some portion of the larynx, making a nidus in which the bacilli could easily lodge and thrive.

Jobson Horne, of London, found by examination that the ventricles of the larynx were frequent lodging places for sputum and the tubercle bacilli. As the result of most careful pathological work Horne also gives the following description of the process of tubercular changes in the lymphatics of the larynx: "The earliest changes noted in the lymphatics were a proliferation of the parenchyma of the acini and efferent ducts, and the formation of masses of small, round cells distending and choking the ducts and obliterating the glands, the adjacent and superficial structures remaining intact." He demonstrated by sections the origin of the giant cell showing, "first, the tubercle bacilli lying amongst the endothelial cells, forming the wall of the lymph space; secondly, the fusion of the adjacent and divided cells, and thirdly, the separation off of this plasmodial mass as a giant cell." He goes on to say: "If, then, as would appear to be the case from the foregoing, the tuberculous process commences in the lymphatics it would be natural to suppose that those parts which are rich in lymphatics would be the more common sights for infiltration and ulceration, while such parts as are without glands would escape ulceration except by continuity. This is clinically verified. The inter-arytenoid region, the posterior third of the cord, the ventricular band and the epiglottis are the parts more richly endowed with glands, and these are the parts more commonly ulcerated in laryngeal tuberculosis."

Friedrich says: "Morbid anatomists are inclined to favor secondary infection from the sputum, while laryngologists are apt to think of it as through the lymphatic or vascular system."

It seems reasonable to think that superficial ulcers, or, as some call them, erosion ulcers, beginning as such, may come from infection through some point of abrasion of the mucous membrane; but that the more common form of infiltration with the smooth, epithelial surface has its origin through the lymphatics. Often those cases which have very abundant sputum are late, if ever, in showing laryngeal disease.

The early recognition of the disease is all-important in giving the patient and physician a chance in fighting it.

As a predisposing cause usually one is found to be debilitated from overwork or exposure, or following some acute illness, such as the grip or pneumonia, and more frequently it appears between the ages of twenty and forty.

There are three forms of laryngeal tuberculosis: Infiltration and degeneration, superficial ulceration, and tuberculomata—named in the order of their frequency.

The first *subjective* symptoms are: Tiring and weakness of or loss of the voice. The voice is weak, as if it were an effort to use the larynx. Usually the first *objective* sign is anæmia of the mucous membrane of the pharynx and larynx. When these conditions are found one ought to keep a most watchful oversight of the patient, with very careful examinations of the lungs, sputum and general health. The temperature and pulse should be watched daily. This can be done by the patient or some one in the family, and a chart kept to show the physician. Some consider a subnormal morning temperature more diagnostic than an afternoon fever.

Hoarseness and a more or less constant cough are soon annoying to the patient. By this time there ought to be seen in the larynx some changes in the arytenoid eminences or inter-arytenoid space. The swelling of the arytenoids is usually bilateral, smooth, pale or slightly congested, and sometmes dotted with minute yellowish points as though tiny seeds were beneath the epithelium.

Unfortunately one does not have the opportunity to see many cases at this stage of the disease. The early inter-arytenoid thickening stretches out almost flat during deep inspiration, but wrinkles up and projects into the glottic chink during light breathing or phonation. Later there is a decided growth, usually rough, and when large likened to a cock's comb. When the little tubercle nodules under the surface begin to break down the ulcer of degeneration appears. This is irregular in outline, with infiltrated edges, shallow and "worm eaten" in appearance, and its floor covered with a grayish granulation.

The erosion ulcer is very superficial and not formed by the breaking down of infiltrated tissue. It is often on the free edge of the epiglottis, the ventricular bands and the arytenoid region. One is likely to confuse this ulcer with a mucous patch, but the surrounding tissue is less hyperæmic. Friedrich says: "No matter how small or superficial an ulcer may appear in a tuberculous patient it should be regarded as tuberculous, as there can be no question of its being catarrhal."

Up to this time there has usually been dryness, irritating cough, slight burning, hoarseness, sensation of a foreign body in the throat, and as soon as ulceration begins pain is present. This is at first noticed only in swallowing, and is more apparent with solids when the epiglottis is affected, and with liquids when the arytenoids are involved.

As the disease progresses the ulcers tend to coalesce, sloughing of tissue takes place, and œdema causes dyspnœa or stenosis.

In chronic laryngitis the hyperæmia is more pronounced than the swelling, and the swelling is more diffuse.

Syphilis will usually be accompanied by a history of infection, the ulcer is usually single, larger, deeper with a highly hyperæmic areola. In syphilis the ulcer is rare on the cord, ventricular gland or arytenoid unless from extension from other areas.

In cancer pain is a very early symptom, and the anterior larynx is more likely to be attacked. Hyperæmia accompanies the ulcer, and stenosis follows earlier than with nearly any other ulcerative condition of the larynx.

Tuberculomata are rare and look very much like fibromata. They are usually situated in the ventricles near the posterior wall. There is little tendency to ulceration, and their diagnosis is not certain except by the microscope.

It has been observed that tuberculosis of the interior of the larynx is less rapid and fatal than when the epiglottis and extra-laryngeal parts are involved. From six to eighteen months in fatal cases is the average lease of life after tuberculosis attacks the laryngeal tissues.

Mackenzie, as late as 1880, said: "The prognosis is always extremely grave, and it is not certain that any cases recover." Later work has enabled one to see a brighter outlook, as many cures are reported. Of course if the lungs are badly involved the prognosis is very grave.

The treatment as reported by the different authors is decidedly varied, but the methods that have been most satisfactory are few. In most classes of cases the general health must be kept up to the highest level. Easily digested, nourishing food, fresh air in abundance, systematic bathing with cold or tepid water, light but warm clothing, and, if possible, a climate where sunshine and dry, bracing air prevail, are all of the utmost importance. At all stages of the disease, daily thorough disinfection of the larynx, pharynx and mouth with some non-irritating antiseptic should be practced. The voice should be given as absolute a rest as is possible, sometimes even restricting a patient to writing in place of speaking. If the larynx is seen in the early stages before ulceration or extensive infiltration takes place, the application of Protargol, 5 per cent. to 10 per cent. solution, on a cotton mop, two or three times a week will probably accomplish all that any local treatment can do. Protargol preceded by formalin, ½ per cent. to 4 per cent., is Lake's favorite treatment in the early stages.

Since Krause, in 1884, introduced lactic acid for local treatment, no

one has produced anything which will compare with it when ulceration appears.

For dysphagia, 10 per cent. menthol in olive oil, injected into the larynx or trachea has proved very satisfactory, and if the surface is abraded, orthoform, as a powder or emulsion, will, with some patients, give relief for twenty-four hours or more at a time.

Aside from the above-mentioned applications the writer has failed to find in his own or others' experience anything that has given any degree of success in other than the hand of the introducer. Numerous drugs and methods of application have had their advocates from time to time but soon nothing more is heard from them.

But in surgery there is a compartively new field which has increased the percentage of recoveries quite materially. Gleitsmann, one of the most skillful and enthusiastic operators in this country, gives the following indications for curettage of the larynx in tuberculosis:

"1. In cases of primary tuberculous affections without pulmonary complications.

"2. In cases with circumscribed ulcerations and infiltrations of the larynx.

"3. In cases with dense, hard infiltrations of the arytenoid region of the posterior wall, also of the ventricular bands and tuberculous tumors of the epiglottis.

"4. In the incipient stage of pulmonary disease, with but little fever and no hectic symptoms.

"5. In advanced pulmonary disease with distressing dysphagia resulting from infiltration of the arytenoids, as the quickest means of giving relief.

"The contra indications are:

"1. Advanced pulmonary disease and hectic.

"2. Disseminated tuberculosis of the larynx.

"3. Extensive infiltrations producting stenosis when tracheotomy is indicated, or laryngotomy can be taken into consideration."

There are, however, those who very strongly oppose operative treatment. Grayson, in his recent text book, says: "Even those who champion its cause most ardently not only admit its limitations, but insist upon a most accurate discrimination in the choice of cases. Even with exercise of this care, however, it is debatable whether the results that it gives are so far superior * * * as to compensate for the inflammatory reaction, the intense suffering and the marked, though temporary, systemic depression exhibited by the patient."

The writer has seen the curetting several times; one case was cured by it and two others reported great relief from the dysphagia.

The electro-cautery skillfully used seems a very good method of destroying tubercular nodules, or in clearing up severe ulcers, as it does not cause hæmorrhage and does not leave a new surface for reinfection.

Scheppegrell reports that cataphoresis with the pure copper electrode has yielded good results. The positive electrode being of pure copper in the form of a small sphere is applied to the tubercular larynx after the parts are anæsthetized with cocaine. The oxychloride of copper is repelled and driven into the tissues, destroying the tubercular deposits without causing annoying sloughing.

It seems probable that the surgical treatment in some form is to become more popular, yielding better results and at least giving great relief in this most distressing of diseases.

The two homœopathic remedies to which the writer pins his faith in this trouble are *Arsenicum iodide* and *Apis;* the former for the general tubercular diathesis, and *Apis* for the œdema. There are many remedies indicated in our text-books, but these two have stood by while others have failed.

DISCUSSION.

J. Henry Hallock, M. D.: I trust you have all been as much interested in Dr. Hoyt's thorough paper as I have been.

He covered the entire ground most carefully.

I agree with Dr. Hoyt in that laryngeal tuberculosis early diagnosed and properly treated offers much more hope than is usually accorded it.

All of us who make a specialty of throat troubles have seen many patients die from this form of tuberculosis, but I have also seen some brilliant results come from treatment.

As Dr. Hoyt says, very much depends upon an early diagnosis and the freedom of the system from tubercular poisons.

Until I learned how to select my cases I expected failure, and usually got it. Now, when a well-marked case of tubercular laryngitis comes to me with considerable lung involvement, I feel that there is little use of more than palliative treatment, but if I find that my patient has little or no recognizable lung lesion, and the system is fairly free from tubercular poisoning, and the larynx shows but a small involvement, I expect, and usually get, a great improvement, if not a complete cure.

To illustrate. I will report a case recently returned to his home in New Haven, Conn.

Mr. B., whose wife has suffered from fibroid phthisis for the last five years, presented himself at my office for examination July 1, 1902.

He was suffering from hoarseness and a burning irritation in his larynx. Some of the time his voice would seem all right, unless he tried to use the telephone.

Examination showed the typical enlargement of the arytenoids with œdema and irritation of mucous membrane of the entire larynx, and on the right vocal cord there was a ragged worm eaten ulcer occupying the middle third of the cord. The epiglottis was not involved, and at this examination I could not detect a lesion in the lung, but on examining him a few weeks later I detected a small consolidation in the right apex.

For the first two weeks I treated him every other day with a twenty-grain, to the ounce, of nitrate of silver, preceded with an application of full strength di-oxygen. This removed the greater share of the irritation and swelling, and I then began a twenty per cent. solution of lactic acid, and soon increased it to forty per cent. This I always preceded with an application of four per cent. formalin. At the same time I built him up with food and tonics, kept him continually in the mountain air, gave him *Arsenicum iod.*, regulated the amount of golf playing, etc.; had him use morning and night a twenty-five per cent. di-oxygen spray, and at the end of seven months nothing remained but a scar where the ulcer had been, and his throat apparently well.

A very important point in this class of ulceration is to rub the acid in thoroughly.

This patient and his throat would stand any amount of misusing, and the application was rubbed well to the bottom of his ulceration each time.

Carl Rust, M. D.: Dr. Hoyt has given us a very valuable paper, and I am thoroughly in accord with all it contains.

The post mortem reveals the presence of tuberculosis in a large number of persons supposed to be healthy, having had no symptoms of such a condition. It also shows that a great many people have had tuberculosis and recovered without causing any very great systemic disturbance. If so many persons have tuberculosis and recover without serious symptoms, and as the post mortem is the only means of establishing a correct diagnosis in a certain per cent. of cases, have we any reliable data upon which we can stand and say positively that this is a case of primary tuberculosis of the larynx? I think not.

The word "relief" should be substituted for "cure" in these cases unless the lung lesion also becomes cured, for so long as it is in the system it is liable to and often does break out again in the immediate vicinity of a former manifestation which has been successfully treated.

If there is infiltration but no ulceration, be very conservative. Don't do too much. If it is severe and tracheotomy is needed, the rest the parts derive from such a procedure has, in a number of cases, restored them to nearly a normal condition. In all cases where an operation seems indicated let it be of the simplest nature possible.

In ulceration lactic acid has given us excellent results. A newer remedy is Methylene blue, which I should advise both locally and internally.

I believe with Dr. Hoyt that a very few remedies cover all that it is possible to do.

R. S. Copeland, M. D.: I would like to ask the doctor whether he has ever used the X-ray in the treatment of this disease, or knows of its having been used?

H. W. Hoyt, M. D.: I have not used it myself; some cases have been reported, I believe, in which it has been used with indifferent success.

H. W. Weaver, M. D.: If any members of the society have had any experience with the X-ray in the treatment of this disease it would be of great interest to hear their results. I have a case of laryngeal tuberculosis that I have been treating for two years without either amelioration or aggravation. It has remained about in statu quo. About the latter part of March, however, he began to fail generally. I could see that things were not going well with him so I advised him to try the X-ray treatment.

The X-ray treatments were continued for four weeks. At first there was decided relief, but immediately following that there was just as decided agravation. The inflammatory process became active, the tissues softened up and broke down, and going into a decline he died very suddenly. I am at a loss to know whether the X-ray injured him or whether it was simply the natural course of the disease. I have had no other experience to offer in this line.

R. S. Copeland, M. D.: How was it applied?

H. W. Weaver, M. D.: By covering the face and body with a lead coil leaving a small exposure of the laryngeal region. The duration of each treatment was about fifteen minutes. There was also tubercular lesion of the lungs. Further than that I can not give you any details.

R. S. Copeland, M. D.: I have recently had occasion to treat a patient with laryngeal tuberculosis in exactly the same way. So far as I can judge there has been no change of any kind. No apparent effect upon the local trouble.

H. S. Weaver, M. D.: In my case there was increase in the expectoration from the very first treatment.

George B. Rice, M. D.: I have been interested in this subject and have tried every local application known to me almost, including lactic acid, cataphoresis with the copper electrode curettement, the iodoform and other emulsions, and all sorts of anæsthetic and antiseptic sprays, which latter include formaldehyde. I can record the cure of two cases. One in my own practice sent me from Rutland Sanitorium. There was loss of vocal sound, aggravated cough, and abundant tubercle bacilli in the expectoration. I began with the iodoform and ether emulsion, lactic acid and antiseptic sprays. Then a two per cent. solution of formaldehyde every other day. At first I applied the medicaments myself, and later she was taught to make the application. This was carried on for a number of months, then the formaldehyde increased to three per cent., as she was able to bear it. She gradually improved, the bacilli disappeared from the sputum, and there was freedom from laryngeal irritation. She

has remained well for two years. Dr. Johnson had a similar case in which he became interested, and in which he carried out the same line of treatment.

C. H. Hubbard, M. D.: When you speak of a two per cent. solution of formaldehyde or formalin, two per cent. of the usual forty per cent. solution is meant, is it not?

George B. Rice, M. D.: Yes, sir. It was applied with a swab, the parts being cleansed and anæsthetized first by means of a cocaine spray. After she became tolerant of the treatments the cocaine was not used at all. Judging from these two cases it would seem that we have in formaldehyde a valuable agent for controlling the disease, and one worthy of more extended trial.

Elmon R. Johnson, M. D.: The case that Dr. Rice refers to was one that he kindly placed in my charge from the dispensary. It was a soldier from the United States Army returned from Cuba. The lungs were affected, there was dullness in the right apex and elevation of temperature. He was not admitted to the Rutland Hospital because they did not think that it was a case amenable to treatment. In addition to the local treatments he had the advantage of dietetic and hygienic care.

In addition to the good results in that case I can report two other cases that came under my care with this same trouble, and who were given the same treatment, and upon whom the same favorable results were attained. The two per cent. formalin was used on both and both cases can be reported as cured at present. They were both taken early in the trouble before a great deal of destruction of lung tissue had gone on. I take your time to speak of these simply to further what seems to be a good line of treatment in a troublesome and discouraging class of cases.

H. W. Hoyt, M. D.: Did the application of the formaldehyde seem to have any direct effect upon the pain or upon the swelling?

Elmon R. Johnson, M. D.: I think that it did upon both. It very quickly seemed to have a subduing effect upon the active inflammatory ulcerative process. Dysphagia was rapidly overcome.

SYPHILIS OF THE EAR.

BY D. A. MACLACHLAN, M. D.,

Detroit, Michigan.

WHEN the President of the Society asked me to present something upon this subject, I did not feel at all enthusiastic about it, mainly perhaps because I could not at the time recall many cases of this sort in my own experience. I felt that there must be many members of the Society who had treated more of such patients, and who were, therefore, better able to write about it.

However, upon looking up authorities on the subject, I was surprised to find that the experience of most aurists was rather limited in such cases, and that a vast deal of uncertainty existed concerning them. The great difficulty in recognizing the syphilitic element in many of these cases, and the reluctance of most of such patients to acknowledge that they have ever had syphilis, doubtless accounts for the paucity of literature upon the subject, and for the comparatively few cases that have been reported.

Buck believes that about three-fourths of one per cent. of all deafness is directly traceable to syphilis. There are probably many more cases in Europe than in the United States, but there are doubtless many more than are credited to this cause, since it is pretty certain that the deafness in many cases ascribed to catarrh, scarlet fever, measles, typhus and various other conditions is actually the remote effect of syphilis.

The majority of recorded cases have been due to the acquired form, but a goodly number are congenital. The congenital cases are apt to be found between the 11th and 18th years; more in females than in males, in the proportion of about 4 to 1; the deafness comes on more rapidly than from other chronic causes, occurring suddenly many times, or requiring only a few weeks or years at most for development, and generally following an attack of interstitial keratitis. It frequently occurs simultaneously in both ears, and is usually very profound and intractable to treatment.

Those cases arising from syphilis in the secondary stage of the acquired form resembles more closely aural catarrh. A sense of fullness and tension, tinnitus of various sorts, sometimes accompanied with autophony, vertiginous sensations, and perhaps more or less pain, although I think the majority of observers agree that pain is more often

due to ulceration of the middle ear, for abscess seems to occur only rarely.

The feature that characterizes syphilitic ear diseases generally, and that leads the patient to consult the aurist, is the sudden and profound deafness in one or both ears. Both are involved at the same time, as a rule, but often in different degrees. It is liable to come at any time during the secondary stage of the disease, being apt to follow "a cold in the head," or in the ears, the congestion at such times precipitating the impending involvement of the ear by the syphilitic process. Probably no other disease brings on such sudden and absolute deafness, and this fact together with the absence of pain should lead the physician to suspect a syphilitic affection in any such case, when investigation may reveal the history of specific infection.

Objective appearances are not often helpful in determining the character of the affection. Neither the middle ear nor the drum show much if any changes, although the latter is said to sometimes appear thickened, opaque or dull, and retracted, this being the case when the Eustachian tubes are partially or wholly closed. Scars in the pharynx or about the openings of the tubes, or infiltrated glands about the throat or neck, would point to syphilis.

If there were loss of bone conduction a diagnosis of labyrinthine involvement would be warranted. If autophony existed while external sounds could be heard, the sound-conducting apparatus would seem to be the portion injured, because if the labyrinth were affected the patient could hardly hear himself. Exaggeration of sounds is said to characterize many cases, also fairly low sounds seeming very high-pitched to the patient.

A great diversity of opinion exists among authorities regarding the pathology of syphilitic ear affections. Many regard the labyrinth as the seat of deafness, while others believe it to be in the middle ear. A careful reading of the conditions of the various writers to the literature of the subject leads one to the conclusion that no definite nor constant location exists. That sometimes it is in the sound-conducting apparatus of the middle ear, at other times the cochlea or others parts of the labyrinth, and at still other times both these and perhaps other parts of its centre in the brain. The process is doubtless that of the disease in other similar tissues throughout the body—inflammation, infiltration, exudation, degeneration, ulceration and cicatrization making the various stages and manifestations of the disease.

Most aurists, I think, are disposed to regard cases of syphilitic deaf-

ness as practically incurable, and the average experience probably justifies the conclusion in a general way. But records show that they are not entirely hopeless. The congenital cases offer the best hope of improvement, and while a good deal of time may be necessary, one may enter upon the treatment of such a case, I think, with considerable hope of accomplishing some benefit. Of course cases of sudden and profound deafness will rarely be much if at all improved by any form of treatment.

I would like to take enough of your time to mention very briefly two or three cases which I recall at this time, and which may have been due to syphilis:

Case One.—Mr. G., a lawyer, consulted me for deafness. No family tendency to deafness elicited. During the war of the Rebellion he had had syphilis, and had taken a good deal of quinine at various times. Three years before noticed deafness after trying a case in court. Took treatment from a prominent aurist for six weeks with no good results. Then was treated by several others, continuing with the last for a year. Meantime had consulted Buck, Sexton and Dench, of New York. While in Congress during the last few months had been treated by a prominent Washington aurist. All had been without avail, however, as he had grown persistently worse.

His general condition was good at the time I saw him. The nose and throat were somewhat catarrhal, but on the whole looked pretty well. Had had the nose "burned out," as he put it, by one of the previous surgeons.

The watch was heard by the right ear only on contact—not at all by the left. Bone conduction reduced to about one-fourth normal, being about the same in each.

The drum little changed in appearance, being only slightly atrophied or retracted, but not very freely movable. Both tubes open to Valsalva's method. Diagnosed involvement of the labyrinth, possibly syphilitic .

A week later hearing for the watch was entirely lost. He then returned to Washington via New York, where he again saw Dench, who, he told me, at his second call upon me, had previously given a diagnosis of affection of the internal ear. Dench advised physiological doses of Pilocarpine by the mouth, sufficient to produce free sweating. Not long after that he took cold, and the next morning awakened absolutely deaf, and has remained so ever since.

The prominent features of this case seem to be the sudden onset, absence of pain and inflammatory symptoms, rapid progress of the disease, futility of treatment, and final sudden disappearance of all hear-

ing. It is surely unusual, and whether or not due to remote effects of syphilis is the question.

Case Two.—Miss LeF., æt. 24, teacher, consulted me about both ears and eyes.

Ten or twelve years before was nearly blind for a year or two. At this time or before had ulceration of the shin bone, and diseased glands in several situations. After vision was somewhat restored the right eye continued to be inflamed. A prominent old school oculist diagnosed glaucoma. No operation was performed. The eye remained diseased, more or less painful, and latterly blind and shrunken. The left eye, which had been regarded as cured, now began to fail, and the right was enucleated.

Following the first affection of the eyes, on awaking one morning she found herself almost entirely deaf in both ears. The left ear improved considerably afterwards, so that she hears conversation fairly well, but the right remained unchanged. There had never been any pain nor other subjective signs or inflammation of the ears, as far as could be learned, and the local appearances gave practically no evidence of disease of the middle ear.

On persistent inquiry the patient's mother acknowledged having had syphilis before her marriage. She had had one child still-born, and another died at about six months from some constitutional disease. The other children, excepting my patient, appeared healthy.

The patient's eye and general health improving under anti-syphilitic treatment until after several months she seemed well, but the hearing remained unchanged.

Case Three.—Norine S., æt. 10. Patient presented at clinic December 8, 1897. Mother showed symptoms of syphilis four months after marriage, and became pregnant four months later.

Had interstitial keratitis in both eyes one year ago, following measles, the right cornea being entirely white, the left only partially so.

About this time became deaf in both ears within three or four days. Her mother thinks the child's hearing was never perfect, but until a year ago she heard ordinary sounds. At the time of examination was absolutely deaf, even the tuning-fork eliciting no signs of appreciation of sound. The deafness was thought to have been caused by the measles. The record makes no mention of changes in the drum or other evidence of disease of the middle ear, although I recall examining them. The child was said to be very backward about talking, and, as might be expected, was very timid and nervous, and not over intelligent.

Aurum mur. was given for a time, but with no apparent results.

A month later the left eye became inflamed, the cornea remaining clear. A fluent coryza was also present. A soothing lotion was prescribed for the eye, the nose and throat was sprayed, and internally she was given *Potassium iodide,* three to four grain doses after meals. The condition improved gradually, until she ceased coming several months

later. Practically the same treatment was followed throughout with the addition, after a time, of the local application of the yellow oxide of mercury ointment to the eye, but there was no change apparent in the condition of the ears.

A year or so later she returned, still deaf, and seeing very poorly. Retinoscopy showed mixed astigmatism, but glasses did not improve the vision.

It is to be regretted that the records are so incomplete, having been made in the hurry of office and hospital work by my assistant, but there could be little if any doubt of the cause of deafness, I think, in the latter cases. The history of congenital syphilis appears sufficiently plain, and the choroidal inflammation of the eye in case two, with the characteristic ear affection, would seem to confine such a diagnosis positively. The diagnosis in case two was made in spite of the mother's denial at first, and when afterwards she confessed her share in the tragedy, the treatment was pursued with greater confidence.

In the treatment of these cases it is pretty generally conceded, I think, that local measures are of little avail. Our old school friends, of course, indulge to the full their fondness for the iodides, both of mercury and of potash. I am free to confess that in urgent cases, at least, I have had results from the use of these drugs in appreciable doses which I have come to believe I could not have secured by the ordinary or accustomed use of the remedies. And here comes in the much mooted and vexed question as to how we shall prescribe and how we shall administer drugs which seem indicated clinically as well as by provings. Personally, any prejudice I may feel concerning the giving of physiological doses, so-called, must stand aside where the good of my patient demands the use of something that has demonstrated its efficiency to cure, in what appears to be large doses. What is the smallest curable dose is the only question for me to consider, at such times.

Pilocarpine, too, must be mentioned in the medication of our old school friends. Claims pro and con have been made for it, and I think there can be no doubt of its merit, in suitable cases and in the proper dose, though according to their usual practice they lauded it extravagantly, used it indiscriminately, and gave it up precipitately, at least many of them have. Will it not be well for us to take a leaf out of their book, and determine just when and where to use it, and when and where *not* to use it?

DISCUSSION.

W. E. Deuel, M. D.: When our President, Dr. Rice, was arranging

his "menu" for this meeting he asked me to open this discussion on syphilis of the ear, but I answered that I knew nothing on the subject. Not because my clientele was any better than other people, but I had had but few cases and did not think myself competent. But as I look over the literature I find that I am not the only ignorant one on the subject.

I think that Dr. MacLachlan has given us a general resume of about all that is known on the subject.

The difficulty is to get data enough to be sure that you are treating a syphilitic subject. Unless you can get an individual specific history or positive results from specific treatment it is impossible to credit to the proper cause for your ear trouble. The only characteristic sign of this disease is the sudden deafness without subjective signs, and still this symptom is prominent enough to always attract your attention.

Many patients may come for treatment of whom you suspect syphilis, but it is congenital, and the individual is innocent of the cause and will deny it when questioned.

We cannot always be as fortunate as Dr. MacLachlan in getting the guilty one to acknowledge the errors of their youth.

I have had one case that I will report as being a case which to my mind there was no question as to the cause of the trouble. I will give only a resume of the case, as the whole history would be necessarily long.

Mr. C. called at my office, after having been away from home on a vacation, with a facial paralysis of the left side; it was well marked and easily diagnosed. He said it came on in the night after he had been on the river facing a cold wind. The cheek became very cold and benumbed. Although I knew that he had had syphilis, I accepted his version of the trouble, and told him that if he was right it would improve. It failed to improve under various kinds of treatment. After a few weeks he came, saying, that he was getting deaf in his left ear; he had noises, but no pain or vertigo, and I could not discover any change in ear subjectively, except the loss of hearing. Then I diagnosed syphilis as the caues of his paralysis and deafness.

The hearing became less and less, until it was all gone, and no treatment that I gave him did any good.

Then began a round of doctors. Any and every kind that he could hear of or was recommended to him. He became melancholia and died at Arkansas, Hot Springs.

This, I think, was a plain case of syphilis with paralysis and ear complication.

A few others I have had, but no different in general treatment, history and results than others have had.

It would seem to me that the middle or internal ear may be affected without the other taking on the disease, or both might be diseased at the same time. You have symptoms that are characteristic of either ear.

Zuber N. Short, M. D.: The subject of Dr. MacLachlan's paper is one which I, at least, approach with some degree of trepidation, for the diagnosis is arrived at so often in doubt, the treatment so unsatisfactory and the results so uncertain, that I attribute the dearth of our literature on this subject to these facts.

Dr. MacLachlan has given us a paper that has covered the subject in a thorough and masterly manner, and I can only hope to emphasize some of the salient points.

We, in Hot Springs, are no doubt inclined to increase the percentage of deafness due to syphilis over that given by the authorities, and I think justly, and this can be accounted for to some extent from the fact that our patients more readily acknowledge to a syphilitic history than they would at their homes. Our experience acquired there leads us to decide in favor of syphilis where there is a doubt as to the cause, but all such must be regarded as speculative, and we so record them.

That there is no definite nor constant location of the lesion I do not think any one will deny.

The prognosis in all cases, whether the cause be acquired or hereditary syphilis, is indeed a doubtful one. Both respond very slowly to treatment, if at all, in any form. There may be a slight advantage in favor of those cases due to hereditary syphilis.

In the treatment of all cases due to acquired syphilis I unhesitatingly resort to the iodides in physiological doses, for that treatment has proven the most satisfactory in my practice. Each case due to hereditary taint I believe to be a law unto itself.

While Pilocarpine has been very highly lauded by some, I find it of value in but very few and isolated cases.

Chas. H. Helfrich, M. D.: The case related by Dr. Deuel recalls to my mind the series of symptoms produced by lesions, usually syphilitic in character, in the internal auditory canal. The involvement of the facial and auditory nerves which pass through this canal gives rise to deafness and facial paralysis on the same side. The symptoms in Dr. Deuel's case seems to confirm such a diagnosis.

The diagnosis which sometimes accompanies keratitis parenchymatosa is thought to be due to changes in the internal auditory canal. The coexistence of deafness in these cases was recognized years ago.

GONORRHŒAL OPHTHALMIA.

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THE President has stated that the subjects selected for consideration at this meeting have all been suggested by different members of the Society, and that in most instances the one suggesting the topic has been the one to prepare the paper upon it. Why this precedence was not followed out in this instance I cannot conceive, unless the one first proposing the subject realized that there was practically nothing new to be brought out upon gonorrhœal ophthalmia to interest a society of specialists. In an unguarded moment I consented to write upon this topic, and you must pardon me if in my effort to find something to excite discussion I enter too much into details familiar to all of you.

The gravity of this disease is so well known to all physicians, general practitioners as well as specialists, that any emphasis of this point is hardly necessary. We shall, therefore, content ourselves with recalling the fact that a large share of the world's blindness is due to purulent conjunctivitis. This percentage is variously estimated at from one-third to one-half. Then when you remember that of all forms of purulent conjunctivitis none are so rapid or are as fatal in their results as gonorrhœal, we begin to appreciate the seriousness of the disease.

Gonorrhœal ophthalmia, *i. e.,* a purulent conjunctivitis, is always an infectious disease due to the presence of a diplococcus first discovered by Neisser in 1879, as distinctive of the discharge of gonorrhœa.

If the gonococci are not present the diagnosis should always be one of purulent conjunctivitis, as it is a well known fact that other microbes will cause a purulent conjunctivitis.

The staphylococcus pyogenes aureus and albus, streptococcus pyogenes and the pneumococcus have all been found in the different forms of purulent inflammation of the conjunctiva.

The direct source of infection is, as a rule, by the hand, and always great emphasis should be placed upon extreme care and cleanliness of the hands for all patients suffering from gonorrhœa. The physician and nurse should also use the utmost precaution to carefully disinfect their own hands before touching their own eyes or those of their patients. This point we believe cannot be too strongly emphasized, and

when we recall that gonococci have often been found in the urethral or vaginal discharge long after the purulent character of the discharge has apparently ceased, we are surprised that more eyes are not infected.

This same care should be taken in treating all discharges for, as has been pointed out, other microbes than gonorrhœal may cause purulent conjunctivitis. The necessity of a careful bacteriological examination for the diagnosis of gonorrhœal conjunctivitis was pointed out by Greeff in the Berl. Klin. Woch., 1901, No. 6, p. 181, who says that only in fourteen cases out of forty cases admitted as blenorrhœa neonatorum to the eye clinic at Breslau, did Groenouw find gonococci. He also says that the gonococcus can only penetrate the intact epithelium of the cornea when it acts for a long time, as when the pus stagnates on the cornea.

We would also at this time refer to a form of gonorrhœal conjunctivitis not due to external infection. Quite a number of writers have called attention to a conjunctivitis existing with a urethral gonorrhœa in which there was no evidence of local infection. These cases, as a rule, seem to be accompanied by little or no suppuration of the conjunctiva. They are supposed to be of a similar origin as the cases of gonorrhœal iritis and gonorrhœal synovitis, etc., and are probably caused by the toxines of the gonococccus circulating in the blood.

Haltenhoff, in the Archives of Ophthalmology, Vol. XV., p. 169, in an article on Conjunctivitis Gonorrhœica Without Inoculation, refers to quite a number of authors who have recognized cases of this character. White says that in seven to eight hundred cases of gonorrhœa there occurs only one case of ophthalmo-blenorrhœa, but finds one case of rheumatic ophthalmia in fifty to sixty cases of gonorrhœa, a relative frequency of 13-14.1. These cases are, as a rule, of a much lighter form than the generally recognized gonorrhœal ophthalmia. There is apt to be but very little if any purulent secretion; frequently both eyes are involved at the same time, and yield promptly to treatment.

The reason that these cases are not more frequently recognized as gonorrhœal is probably because not having the usual appearance of the classical disease; the oculist makes no inquiry or search for the coexisting urethral gonorrhœa.

To return to the typical form of gonorrhœal ophthalmia, its onset varies from ten hours to three days after infection.

The virulence of the disease is greater and its period of incubation shorter than other forms of purulent conjunctivitis, because of the intensity of the poison. We have seen cases of this disease within a few

hours after the first sign of congestion and catarrhal secretion develop into a most intense and actue condition; the lids become intensely swollen, red, hard and shiny. The conjunctiva swollen, infiltrated, chemosed and a profuse, thick, creamy discharge oozing constantly from between the lids. At this stage of the disease the chemosis becomes intense, it rolls up over the cornea giving it the appearance as though sunken beneath the swollen conjunctiva. This excessive chemosis is for two reasons the most dangerous feature of the disease; first. the swelling and infiltration of the conjunctiva shut off by constriction, the nourishment of the cornea, and secondly, by its overlapping the cornea it hides from view the process that is going on underneath, and by preventing thorough cleanliness holds this very infectious discharge filled with gonococci, constantly in contact with the cornea. The cornea thus deprived of its nutrition and continually bathed in pus soon becomes infected, and an ulceration is formed. Such a small peripheral ulceration which ordinarily would be of little importance extends in such an eye as this all too rapidly into a general slough of the cornea. Burnett. in describing this process says: "The epithelium becomes steamy, and the tissues seem to melt down like snow under the sun."

Frequently the destruction is so extensive as to allow with the giving away of the cornea the escape of the lens, and with the entrance of the pyogenic germs into the interior of the eye panophthalmitis develops.

The disease if left to itself will run its course in from three to six weeks, ending in an atrophied ball with a chronic inflammation and muco-purulent discharge. This brief description pictures the salient features of the disease which we have all too frequently seen follow this course without regard to any or every treatment that may be used.

Treatment: As a prelude to what may be said under this heading, I would say that *at times all* treatment has proven most disappointing to me. In other cases I have had very satisfactory results. Why I have been able to check the ravages of the disease in one case and not in the other I have been unable to determine.

As a general maxim, the sequel of success in this disease rests in getting your case *early;* yet there certainly seems to be a difference in cases, some, as Burnett says, *"melt down like snow under the sun,"* while other eyes seem to have a much greater power of resistance.

In my experience I expect, if the case comes under treatment before there has been decided chemosis and before any involvement of the cornea, to carry the case through to complete recovery. If there is marked chemosis but with no corneal complications I still feel that there

is a fair chance of saving the eye. But if in addition to a decided chemosis there is a haziness or an ulceration of the cornea at the time the case is first seen, I expect to lose the eye regardless of all treatment. To be sure I have seen some of these cases get well with good vision, but it is the exception rather than the rule.

In considering the treatment of this disease let me first outline what might be said to be my routine treatment. If the case were seen, say, within twenty-four hours after the infection, my custom *has been* to make one application of the Nitrate of silver, forty grains to the ounce, to the conjunctiva of both upper and lower lids of the affected eye, washing off the excess at once with a normal salt solution. I believe I have seen cases aborted by such treatment. I am aware that in recent years this abortive treatment has been tabooed by some authorities. Prof. Greeff, in 1901, said: "A solution of Nitrate of silver, 1:4000, destroys gonococci with certainty. Weaker solutions penetrate more into the depth of the tissues, while strong solutions prevent this by coagulating the surface."

Burnett says: "Any attempt at abortion after the stage of hyperæmia has once set in, and before that of secretion begins, is to be deprecated."

Since seeing these and other similar opinions it has not been my good fortune to have seen a case of gonorrhœal conjunctivitis early enough to indicate any effort at abortion, and as there is certainly a possibility that the use of caustics may aggravate the condition, I think that in the next case that falls into my hands I shall try the milder methods, even at the start.

Gonorrhœal ophthalmia, however, is so very rapid in its onset and course that the oculist rarely meets with the disease until it has became a well marked typical and serious condition. The stage of secretion has already set in, and oftentimes chemosis and ulceration.

If but one eye is affected, the very first step should be, of course, to hermetically seal the unaffected eye. For this purpose I prefer the watch crystal held in place by adhesive straps. In applying these be extremely particular to absolutely close the nasal side; at the temporal a small opening may be left. The next, and to me the most important step in the treatment, is to maintain *absolute cleanliness* of the eye. For this purpose Formalin, 1-2000, has given me the best satisfaction, and in bad cases should be used every ten to twenty minutes, according to the amount of the discharge.

One pointer in the use of cleanliness where there is much swelling

of the lids, do not trust any nurse to insert the point of a syringe or eye-dropper under the lids for any purpose. By opening the lids gently and as much as possible, the liquid to be used may be squeezed from a wad of absorbent cotton and allowed to run over as much of the surface as possible. This method thoroughly used and frequently repeated will suffice to keep the eye clean and without the danger of wounding the cornea with the point of the syringe or dropper, which I believe has been the commencement of many ulcerations and sloughs of the cornea. I prefer to take the chances of some infectious matter remaining rather than the possibility of an injury to the cornea.

If the cornea is not involved pads of absorbent cotton made ice cold by laying a number of them on a large block of ice and a fresh one applied to the eye every one or two minutes both night and day is most beneficial. The best effect of cold is reached when used continuously. Alternations of heat and cold are detrimental. When any involvement of the cornea cold applications should be stopped, as it impoverishes the nourishment of the cornea, and leads to more rapid breaking down of tissue. Cold is of the greatest value in the very early stages of the disease, and in my opinion it is sometimes continued too long; certainly after the first appearance of a steamy condition of the cornea heat should be substituted for cold. Heat is best applied by immersing the eye in a cup filled to the brim with water as hot as can be borne.

Next, as to the distinctive treatment of this disease, we will first refer to the use of Nitrate of silver, because since it was first suggested by von Graefe it has become the routine treatment by nearly all oculists. The power of Nitrate of silver over this disease is mainly due to its germicidal action. It not only destroys the infecting germs but the epithelia layer of the conjunctiva as well, and by this action it gets at the germs better than any other drug used. Nitrate of silver has been used in varying strengths from two to forty grains to the ounce. My own preference has always been for the weaker solutions, two to five grains to the ounce, applied two or three times a day. One caution should always be borne in mind in using the stronger solutions, and that is to always neutralize the excess of silver by washing off with salt and water solution.

Within the last two or three years other of the silver salts have been used in this disease, with, we believe, very general satisfaction.

Protargol especially has given most excellent results in my hands. In ordinary cases a 10 to 20 per cent. solution applied two or three times a day seems to me the most serviceable, though in very severe

cases I have used it as strong as 40 per cent. One peculiarity of Protargol is that it seems to cause no pain when applied to the eye even in these strong solutions, yet I am informed by Carleton that in urethritis even a 2 per cent. solution will cause very severe pain. He, therefore, uses Protargol in urethritis in one-half of one per cent. solution with good results, but says he gets better results in destroying the gonococci from Argyrol, which he uses in a 2 per cent. solution, and believes it has a greater germicidal effect than does the Protargol. Stephenson, of Edinburgh, says of Protargol: "In conjunctivitis due to gonococci the results are better than with any silver salt previously used." "Corneal complications are a special indication for the use of the strong solution." I recall one case in which there was a very bad ulceration that ordinarily I should have expected to have gone on to a complete slough of the cornea, which was promptly checked and healed nicely under the use of a 40 per cent. solution of Protargol.

Argyrol is a more recent silver preparation that I have used with the greatest satisfaction in many cases of muco-purulent conjunctivitis, but have not had an opportunity to try it in the gonorrhœal ophthalmia. At the present time Protargol has entirely supplanted the Nitrate of silver in my hands, and my impression now is from the experience of others and my own use so far, that Arygol will after a more extended trial in turn supplant the Protargol. Argyrol I believe should be used to get the best results in at least double the strength we would use Protargol.

Finally, as to the use of the homœopathic remedy in this disease. I believe the properly selected remedy exerts a most valuable influence in this as in all other diseases, but as we have here a most powerful and malignant germ to combat, and one which leads rapidly to blindness, I do not feel justified in omitting to use local treatment to destroy these germs.

Argentum nit.—I have found more benefit from this remedy in this disease than from any other drug. A profuse purulent discharge, great swelling of the lids, intense chemosis, and with commencing haziness of the cornea, will often be beautifully controlled under this remedy.

Hepar.—Where there is ulceration of the cornea of the deep, sloughing variety, and especially if hypopyon be present. It has also the swollen lids, chemosis and sensitiveness of the eye to touch. The purulent secretion seems to be less profuse and not as yellow as that of *Argentum nit.*, more of a yellowish white.

Mercurius.—The discharges are more muco-purulent, thin and ex-

coriating. Not so much swelling of the lids or chemosis. More in the later stages of the disease.

Calcarea hypophos.—Extensive ulceration of the cornea with a tendency to slough of the entire cornea, in old, debilitated patients who have little vitality.

Rhus tox.—In cases where the lids are red and œdematously swollen, profuse flow of tears, discharges thick and yellow.

Other remedies, such as *Acon., Apis, Pulsat., Sulphur,* etc., have been useful in some cases.

DISCUSSION.

Geo. A. Shepard, M. D.: In discussing a paper on gonorrhœal ophthalmia I find it difficult to bring out any new facts as to diagnosis or treatment. But there are a few points left open by the writer of the paper. I believe that abortive treatment can be successfully undertaken if begun early. Six years ago a lawyer came to me giving a history of gonorrhœa. Three or four hours before seeing me the conjunctiva of both eyes began to inflame, and he gave it immediate attention. At the time of his visit, the membrane showed intense hyperæmia with prominent papillæ, but no discharge. I applied Nitrate of silver, gr. xxx to ℥j, put him to bed and used ice. In two days he was about well. Although no gonococcus was searched for, I believe that the conjunctival infection had taken place. Two months ago a patient presented one eye in an advanced stage of inflammation with profuse discharge. The other eye was inflamed, and there was a slight muco-purulent discharge. I applied Argyrol, gr. c to ℥j, and used ice. The discharge from this eye stopped in less than two days, but the hyperæmia lasted for six weeks. The other eye went on to perforation.

For three years I have used Protargol, usually in the strength of gr. xl to ℥j, and have found it extremely satisfactory. No case has shown any tendency to croupous membrane. During the past six months I have used Argyrol in several cases in the strength of gr. c to ℥j, and have had one which developed a croupous membrane after nine applications in three days. This membrane disappeared after discontinuance of the Argyrol and the application of Protargol, gr. xl-℥j. Although great care must be taken in cleansing the eye in order not to injure the corneal epithelium, the margin of the cornea, which is so often covered by the chemosed conjunctiva, should not be neglected and the gonococci be allowed to remain in fatal contact with the epithelium. My experience has been that the margin not the centre of the cornea is the starting point of most perforating ulcers.

For the hypertrophied condition of the conjunctiva which usually persists for a long time, purely astringent remedies are useful, such as Zinc. sulphate, gr. ii to ℥j, crystal of copper sulphate or Alum applied daily.

I want to caution against excision of prolapsed iris as predisposing to infection of the eyeball. Except there be a very large perforation the prolapse will gradually disappear with the contraction of the scar tissue.

When there is extreme swelling of the conjunctiva and lids canthotomy is of great value. With strong scissors open up the external canthus, severing the orbicularis. This simple operation reduces the swelling by depletion, and removes the pressure of the lid. Healing takes place without deformity.

In reference to gonorrhœal ophthalmia not due to external infection, as mentioned by the writer of the paper, I have not been able, in my practice, to prove its existence. Conjunctivitis due to toxins in the blood must be persistent from the nature of the cause. There are few cases of persistent inflammation of the conjunctiva that are not amenable to local treatment, or that do not occur in persons with uncorrected refractive errors, nasal obstructions, or suffering from uric acid diathesis, etc. Until we can eliminate these common factors we ought not to give too much consideration to the toxins of the gonococcus.

I cannot add to the internal remedies given in the paper, but locally Protonuclein special and Bovinine have been of service in retarding the destruction of the cornea.

G .F. Bagby, M. D.: The subject of gonorrhœol ophthalmia has been discussed and rediscussed by the ablest men in all countries, and while there are some points upon which all unite there are some others upon which they widely differ.

The theory of infection is undeniable. The source of infection is usually the hands, towels, wash bowls, etc.

During the past year a case came under my treatment which I have no doubt resulted from using the same towel and bowl, as a younger brother who had gonorrhœa. And so I am led to say just here that the general practitioner who treats a patient for gonorrhœa and does not warn him of the possibility of infecting his own or some one else eyes does not live up to his duty as a physician.

And since the statisticians estimate that from one-third to one-half of the blindness in the world results from purulent conjunctivitis, should not we, as oculists, emphasize more than we do the importance of prophylactic measures in such cases.

I am convinced that the greatest progress in medicine in the next generation will be made along the lines of prophylactic and not curative medicine. And I would that the O., O. and L. Society might catch the spirit and take the initiative in the movement.

Should one eye be affected we should guard very carefully the other as soon as the diagnosis is definitely settled. For this purpose Buller's shield or a watch crystal secured over the eye with strips of gauze and collodion makes probably the best and most easily managed dressing, and permits the eye to be readily inspected. So much for the prophylactic treatment.

During the initial stage of the disease our patient may be given much comfort, and the swelling and inflammation greatly decreased by the discreet use of ice cold compresses. These are used in my practice very much as the doctor has described. The nurse should frequently immerse her hands in a 1 per cent. solution of Permanganate of potash while making these applications. And we should bear in mind that it is from the continuous cold that we hope to derive benefit. Some months ago I purchased a clever little device for the application of heat or cold to the eyes, which I have with me. It consists, as you see, of a hollow tubing of rubber made to fit snugly the eyes, and has an inlet and an outlet for water, which can be used at any temperature desirable. The water can be allowed to flow out as slowly or as rapidly as is necessary. It was purchased of the H. H. Hessler Company, of Cleveland, Ohio, and I think is admirably adapted for the purpose for which it was made.

I am heartily in accord with the doctor when he says that in spite of any and all treatment some cases of gonorrhœal ophthalmia will go on to complete destruction of the eye, while others make a nice recovery. I have sometimes thought, and still believe, that the condition of the patient enters largely into the prognosis of the case. We may have two cases under the same treatment, and if the one is a sickly dyspeptic, with constipation, poor appetite, etc., etc., and the other a fellow who has always regarded strictly the laws of hygiene as to eating, bathing, sleeping, regularity of the bowels, and whose physicial condition is above par, we can say which one will make the best and quickest recovery.

Frequent and thorough cleansing of the conjunctival sac is very essential to success in the treatment. The nurse may do this as often as every fifteen or thirty minutes. I do not believe that we have anything better than the Bichloride, 1-5000, or Formaldehyde, 1-5000 or 6000. Acetozone is a recent preparation from the laboratory of Parke, Davis & Co., which may prove very efficient. The claim is made that it is 30 times as powerful as the Bichloride, and yet harmless. I have not had occasion to use it, but shall do so when I need it.

The physician should see the patient as often as two or three times a day, and give the more thorough treatment. This is my method: After a few drops of a 4 per cent. solution of Cocaine take a pledget of sterilized cotton wrapped on the end of a carrier, dipped in powdered Boracic acid, and after everting the lids where it is possible, gently wipe away all the secretions. Then apply thoroughly a solution of Nitrate of silver, 10 grains to the ounce. This is preceded by the usual cleansing above mentioned. The drying of the mucous membrane greatly facilitates the absorption of the silver solution.

There are several other silver preparations, such as Protargol, Argyrol, Argonin, etc., for which many advantages are claimed; but I am not sure that they are as effective as the Nitrate of silver.

I have used Argyrol in a 10 per cent. solution for some forms of conjunctivitis, but never in the purulent.

If the cornea begins to break down heat should be substituted for the

cold applications. If the ulcer is near the center of the cornea and perforation threatens, a mydriatic may be used; but the use of a mydriatic is not desirable since the vitality of the cornea is always lowered thereby.

When the ulcer is near the edge of the cornea a myotic may be necessary.

And we can use with telling effect the remedies so well given us by Dr. Norton.

Walter Strong, M. D.: Any subject affecting the health of the community will bear repetition. Especially is this true of a topic like gonorrhœal ophthalmia, which, in spite of the attention it has received from the profession, is not yet sufficiently within the jurisdiction of preventive medicine. If any further excuse be necessary for occupying the time of this Society with a discussion of such a threadbare subject I would remind you that the treatment of this disease is far from satisfactory, as is conclusively shown by the number of eyes destroyed by it, and also by the prompt manner in which the profession becomes enthusiastic over each new silver preparation offered by the chemist, having in a short space of time experimented with Actol, Itrol, Argonin, Argentamin, Nargol, Largin, Protargol and Argyrol, each in its turn having its day and then discarded for a newer preparation.

Dr. Norton has so fully pictured the essential features of the disease, its course and its cause, that we may at once turn our attention to the more practical portion of the discussion and enter at once upon a consideration of the treatment.

In the treatment of this disease I have had considerable experience, and the more I see of this affection the more fully I am convinced that the most important feature in its successful management is the mechanical treatment. By the mechanical treatment I mean the frequent and thorough cleansing of the conjunctival sac with some mild antiseptic solution, depending more upon the frequency and thoroughness of the cleansing than upon the antiseptic properties of the lotion employed.

Such being the case, it will not surprise you to learn that I still use a 3 per cent. solution of Boric acid for this purpose, it being non-irritating, and unlike the stronger antiseptic solutions has no tendency to cause a chemical necrosis of the superficial layers of the cornea and thus favor an infection of the deeper structures. It is my custom to have the Boric acid solution used in liberal quantities at short intervals, every half hour or oftener, according to the severity of the case and the amount of the discharge.

Next in importance I would place those measures which have a tendency to retard the development of the micro-organism. One of the most essential conditions for the cultivation of the gonococci is heat, it being impossible to successfully cultivate these germs in any media without a temperature of from 35 to 37 degrees centigrade. It naturally follows that the application of cold compresses to the closed lids not only relieves the congestion of the tissues, but retards the activity and

multiplication of the germs causing the disease. Of course if degenerative changes take place in the corneal tissue these applications are contra-indicated, but otherwise the continuous application of cold is of the utmost importance.

The destruction of the micro-organism by means of chemical agents should next claim our attention. Upon this portion of the treatment there exists a wide diversity of opinion, not only as to the preparation to be employed, but also as to the strength of the solution to be used. Personally, I do not look upon this portion of the treatment as being the most important feaure, feeling sure that complete destruction of all germs present in the eye could only be accomplished by the use of a chemical so strong as to seriously jeopardize the integrity of all the tissues of the eye. In my practice I still adhere to the Nitrate of silver, which I use in a 2 per cent. solution, applying it to the conjunctiva of the lids twice daily, and discontinuing its use so soon as the discharge diminishes. I am opposed to the use of strong solutions (10 per cent.), never having seen good follow their application, and being skeptical regarding their ability to abort the disease when once started.

Constitutional treatment should be directed to the general improvement of the patient's general condition. *Aconite, Argentum, Pulsatilla and Rhus tox.* are the remedies which have proven most serviceable to me.

And last, but by no means least, a few words concerning the role of the nurse in these cases. In no class of cases are the services of a competent trained unrse of so much aid and importance as in the treatment of purulent ophthalmia; in my opinion the success or non-success of many of our cases are due more to the care and attention of the nurse than to skill of the surgeon's treatment, a fact which should be realized by surgeon, nurse and patient.

C. J. Swan, M. D.: There is one point in the local treatment of this disease that has not been touched upon at all, and one medicament that is absolutely essential in my opinion to the proper handling of this disease. It is a simple application and is known to you all as Vaseline. In all cases where this is not used the lids are stuck together by the secretion, thus retaining the pus and doing more damage than can be undone easily. I suppose all the doctors here use it, but it was not mentioned either in the paper or in the discussion, probably because it was thought too simple and well known, but still I think it should be mentioned. I use the white vaseline myself, which is procurable in tubes, and instruct the nurse, after free washing of the eye, to squeeze a little into the conjunctival sac. When this is done I have noticed that the necessity for another washing does not recur so frequently. It seems to retard the secretion. While it seems so simple, it ought not to be underestimated. These cases tax all our ingenuity and resources, and when it comes to a method of applying the washes, you will find that the best method is by means of a fountain syinge. A little force is necessary and can be obtained, at the same time regulated with the fountain syringe better than any other way. The point that was made about good

nurses is a very important one. Many nurses do not know how to thoroughly cleanse an eye; they make a bluff at it without actually doing it. In regard to silver preparations I have used Protargol and Argyrol with fair success, but in several cases I have had to return to the old Argentum nitrate, in strong solution (40 gr. to ounce), in two cases with good effect. I believe that the strong solution of Nitrate of silver is one of our best agents, applied once in twenty-four or forty-eight hours in obstinate cases.

H. D. Schenck, M. D.: I want to add my testimony to the beneficial effect of Argyrol in twenty-five grain solution. It cures more promptly than any other agent that I have used.

R. S. Copeland, M. D.: I think that the members will agree that I do not, as a rule, depart from the classical methods of treatment, but I want to give testimony here that many of you will regard as remarkable. I have never used silver in any form in the treatment of ophthalmia. Boracic acid and careful nursing and cleansing of the parts at frequent intervals have proved all sufficient, and I have never felt the need of strong germicidal agents.

E. B. Hooker, M. D.: I proposed this subject to the president from the standpoint of a general practitioner. I have had little experience with it except in the newborn. Only occasionally I see such cases in an adult. I believe that there is no silver salt so efficacious as the Argyrol. I was led to use it in eye cases from my experience in gonorrhœa. It can be used as strong as thirty per cent. without irritation. I was interested in hearing the gentleman speak of the great usefulness of Vaseline. I think that a drop of cod liver oil in those severe cases will answer equally well to keep the lids from sticking, and will be much better from the fact that the cornea will derive some nourishment from it. By this means we might be able to avert ulceration of the cornea.

G. A. Suffa, M. D.: I wish to endorse the statement of Dr. Copeland in regard to the treatment of such cases without the use of silver salts, although my position is not so radical as his. I have treated many cases without anything more than thorough irrigation and with entire success. I never use the Nitrate of silver daily or at any regular interval. An application checks the secretion, and after that I watch the case and use it again when the secretion shows signs of coming back again. Increased secretion is my indication for its use.

C. H. Hubbard, M. D.: Many times our efforts are made null and void by carelessness in little details of nursing. I was impressed by that fact in noticing the methods used by mothers and nurses in introducing medicine into the eye, the tip of the dropper being permitted to come into contact with some portion of the tissues of the eye. This is a reprehensible practice, and only needs to be mentioned to be condemned. A piece of absorbent cotton used once only answers every purpose better than does the dropper.

W. R. King, M. D.: I want to just mention one point not spoken of yet. It is the question of the occurrence of gonorrhœal ophthalmia in

cases of constitutional infection, without the possibility of direct infection or contagion. I have had occasion to see two such cases occurring during attacks of gonorrhœal rheumatism. In the one case the rheumatism had been going on for some weeks when a marked ophthalmia developed, and I was called in consultation. There was not the characteristic symptoms of the ordinary case, and I doubt if the gonococcus would have been discovered in the secretion. It was not the characteristic purulent secretion of gonorrhœal ophthalmia, but rather of a mucopurulent character; not the creamy pus usually found in those cases of direct infection. I am inclined to doubt direct infection, but think that it was a manifestation of the constitutional dyscrasia, due to the same cause that produced the rheumatism. This would seem to show that there is a gonorrhœal inflammation of the eye not due to direct infection.

C. L. Rumsey, M. D.: I saw a case recently where sloughing of the cornea had begun. It had been my practice to use Enzymol or some other food preparation in such cases. I used Xeroform in this case with good results. Where ulceration has assumed serious proportions, as regards extension and depth, I find nothing so effective as slight cauterization of the whole of the affected area with the galvanocautery. As infectious elements lodged between the cilia and the internal angle of the eye, reinoculations can be prevented by savonnage with Protargol of the cilia and the border of the eyelids. Pure white vaseline taken on a probe and introduced as thoroughly as possible under the lids from one to four times daily is soothing to the patient and beneficial to the cornea. I make these suggestions, as the integrity of the cornea is our purpose of treatment.

W. W. Blair, M. D.: In the matter of therapeutics of gonorrhœal ophthalmia enough stress has not been laid upon the possible deleterious effects of cold applications. We have been led by the text-books to use cold very largely in acute inflammations, and I think that it has been overdone. It may favor the very thing that we are trying to prevent, namely, ulceration of the cornea.

The use of Cocaine was spoken of by one of the discussors. I should be very loath to employ it in this class of cases. The drying and dessicating effect of Cocaine might precipitate an ulceration which was threatening but did not exist. In regard to prognosis, I consider it very uncertain; some cases get well promptly, other cases that are apparently no worse go the other way with equal promptitude. Cases that occur from auto-infection I regard as the worst, the most likely to go wrong. With me Argyrol has almost entirely supplanted the Nitrate of silver in all kinds of ophthalmias. I have used it as strong as fifty per cent.

E. W. Beebe, M. D.: After listening to some of the discussion in the bureaus of the American Institute, I began to think that I was not a homœopath at all, but now I am gratified to learn that one may use external applications without being thrown out of the ranks. I am glad that I have heard this discussion; for my part I am in the same boat with all the rest of you. I do not know how to treat these cases without local

applications. In regard to the newer preparations of silver I have not had the good results from them that I have been in the habit of receiving from the old-fashioned Nitrate of silver.

J. M. Fawcett, M. D.: I can confirm Dr. Rumsey's experience with Boracic acid. I was called to see a baby that had been treated with Boracic acid solution, and it was claimed that it had been carried out very thoroughly. In spite of it there was ulceration of the cornea of one eye and chemosis in both eyes. Protargol cured it in about a week. I prefer to use some silver preparation in addition to cleanliness.

A. B. Norton, M. D.: In regard to abortive treatment, it is very rare that we see a case in time to use that treatment effectively. I have seen a few cases aborted by the use of strong solutions, but as I said it is rarely that we get a chance to see a case early enough. My own choice is for the weaker solutions of silver, for the reason that they penetrate more deeply into the tissues, and act as an effective germicide, because they get where the germs are. On the other hand, the strong preparations have a cauterizing action on the surface, but do not get in deep enough to act on the germs. I feel that there is a good deal of merit in that idea or principle. In regard to local nourishment of the cornea I believe that it can be done. I have a case in mind that occurred this winter; it was not gonorrhœal, but it will bring out the point. In a case of cataract extraction in which nothing unusual had occurred there developed half an hour after the operation a bad heart failure and œdema of the lungs. I got back to the hospital as quickly as possible, at a loss to account for the trouble. A preliminary iridectomy had been made without any trouble. Cocaine was used for the cataract extraction, but could hardly be responsible for the sudden change. It seemed that she was going to pass away. No attention was paid to the eye at this time, all our attention being directed to saving her life. When she got better I found that the eye was healing fairly well, although excessively congested.

Soon after I noticed a little line of peripheral ulceration. I thought that the eye was gone, because when you see that in old people there is a very slim chance of saving the eye. It leads on to general sloughing of the cornea. I used Bovinine as a local nutrient to the cornea, together with Protonuclein. Greatly to my surprise, it stopped that ulceration from extending. After this the patient developed glaucoma. The family declined to have anything done for the glaucoma, and she did not survive.

R. S. Copeland, M. D.: Were you giving the remedy at the same time?

A. B. Norton, M. D.: Yes, sir; but I attribute the arrest of the ulceration to the Bovinine. In regard to the application of cold, the point brought up by Dr. Blair, I believe that many eyes are damaged by the injudicious use of cold. It is appropriate in the first stages of an inflammation only. The progress of the case should be watched carefully, and the cold stopped at the right time. I never use Boracic acid, I believe that the common use of Boracic acid has allowed many people to go on

to blindness when something stronger and more appropriate would have saved them. The trouble is that it is relied upon when something else is urgently needed

Irrigation of the eye is excellent and necessary, but I feel that something more is necessary than simple cleansing. I feel that I must do something to destroy those germs. Hence I use weak solutions of germicides. Many times cases of purulent ophthalmia are called gonorrhœal when they are not so, and simple cleansing will be all sufficient. Such cases will get along nicely under irrigation or simple mild astringents, but the real true gonorrhœal inflammation requires something more than that.

THE DANGERS OF THROAT OPERATIONS.

BY EDWARD BEECHER HOOKER, M. D.,

Hartford, Conn.

THE first question which is almost always asked when an operation upon the throat is advised is: "Doctor, is there any danger?" To answer this question truthfully is the purpose of this brief paper. The question is most frequently asked by a parent in regard to a child, and it is our duty to reply as accurately as the facts in our possession permit.

I use the term throat loosely, including not only the pharynx but the vault of the pharynx as well, and I have in mind the more common operations which are performed under anæsthesia, such as removal of adenoid growths and hypertrophied tonsils. I purposely exclude more serious operations, such as tracheotomy and operations upon the larynx and pharynx for cancer, where there are grave pathological conditions which are in themeslves a menace to life.

The dangers attending these more simple operations, which are performed for the purpose of removing obstructions from the upper air passages, arise from four sources.

1. Anæsthetics.
2. Hæmorrhage.
3. Foreign substances in larynx and lungs.
4. Sepsis.

Dangers Arising From Anaesthetics.—Although anæsthesia is produced with so little danger that in healthy subjects we hardly consider it a factor to be taken into account, yet in answering the question before us we have to admit that there is always some danger, and that it is impossible to know in advance how an individual will be effected by an anæsthetic. A committee of the British Medical Association, after ten years of collective investigation, reported that in a total of 25,163 instances of anæsthesia, from all kinds of anæsthetics, 733 cases of unusual effects occurred, with 29 deaths. That is only one death in every 867 cases, but there is no way of telling when that one death will occur. It may be the first case, it may be the last, perhaps it may never happen, but it behooves us to discover, if possible, why death is caused at all and how

it may be prevented. Of the 29 deaths not one was caused entirely by ether; three were attributed to chloroform alone, four to chloroform primarily, and the rest to the anæsthetic, the patient's condition and the operation.

During the past three years there has been a deal of investigation and writing upon anæsthetics, and the conclusions reached by different observers are widely at variance at some points, yet in the main the investigators are in substantial agreement.

In the administration of chloroform the greatest danger of sudden death occurs in the early stage of anæsthesia, when the patient is going under. This fact of the danger of semi-anæsthesia is of great importance and presents contradictory features which are hard to explain. Chloroform occasionally causes a rise in blood pressure at the outset of administration, but "the important, constant and lasting phenomenon of chloroform inhalation is the fall of the blood pressure, and the great danger of this form of anæsthesia is the reduction of the blood pressure below certain limits. Under ether, on the other hand, even when given continuously and in relatively large doses, the blood pressure remains for a long time at about normal or even above normal." In most cases of fatal chloroform toxæmia respiration ceases before the heart's action stops, because of absence of stimulation of the respiratory centre from lowered blood pressure. Right here is the main difference of opinion in regard to the cause of death, some believing that paralysis of respiration is the cause, others maintaining that paralysis of the cardio-vascular apparatus takes place at the same time with that of the respiratory centres. Whichever theory is correct, one fact stands out with striking prominence and its importance cannot be overestimated, and that is that "stoppage of the respiration, although not serious in itself, is nevertheless an extremely important symptom, for it indicates a near approach of an irremediable interference with the circulation. The patient almost always survives if the anæsthetic is stopped and artificial respiration practiced as soon as natural respiration has ceased, but if at this stage the cardio-vascular apparatus happens to be so affected that the blood pressure has fallen nearly to zero, the case is hopeless."

Since the danger period of chloroform inhalation is in the early stage it is surprising that more accidents do not follow its use in obstetrical practice, for chloroform is the anæsthetic most commonly used to mitigate the pains of labor, and the patient is seldom brought to the condition of complete unconsciousness for this purpose, but inhales just enough to render her partly oblivious of the pains which are racking her.

It may be that some of the sudden, unaccountable deaths which occur during labor, or immediately after it, are really the result of chloroform poisoning in abnormaly susceptible subjects. Yet the use of chloroform is so universal and the accidents from it in labor so very rare that its safety must depend upon the difference in conditions which prevail. During the pains of labor the whole muscular system is in a state of great activity, the blood is squeezed out of the veins by muscular contractions, and it would require a larger quantity of the anæsthetic to produce a fall in blood pressure than during ordinary anæsthesia for operations. The woman in labor, too, is not in a state of fear, such as may exist at the beginning of operations. She may be apprehensive as to the outcome of her confinement, but when a violent uterine contraction seizes her in its grip fear is not the emotion which she experiences. She is in severe pain and she welcomes the relief which the anæsthetic affords. I believe her mental condition to be one element in the safety of the anæsthetic.

Under ether primary heart failure is very rare, and it must be conceded that it is a safer anæsthetic than chloroform. "When accidents do occur during etherization they usually result from a disregard of the danger signals or from over-etherization, not from the intrinsic effect of the drug." Patients with heart lesions bear ether surprisingly well, but when there are lung complications there is greater danger. One of the faulty methods of administering ether is to command the patient to take deep breaths; this results in over-oxygenation of the blood and enables him to go a long time without breathing, and the effort of deep breathing fatigues him, so that respiration becomes irregular. This leads to the conclusion upon which there is universal agreement, that only a skilled anæsthetizer should be permitted to induce anæsthesia, one who is alert to note the early danger signals, quick to interpret and resourceful in overcoming the dangers as they arise.

The combination of nitrous oxide with ether, or the induction of anæsthesia by the former, and its continuance with ether, has become a favorite method with many surgeons, and has strong arguments in its favor, which are the greater comfort to the patient, the saving of time, decreases in mucous secretion (very important in throat operations), smaller amount of ether required, and therefore less danger during operation and less liability to kidney complication subsequently.

The following conclusions are a fair statement of the views prevailing today in regard to anæsthetics:

1. Chloroform should not be given in myocarditis.

2. Ether should not be given when there is hyperæmia or stenosis of the respiratory tract.

3. Ether is also contra-indicated in cases where there is high arterial tension or athermatous changes in the blood-vessels.

4. Ether in general contra-indicated in diseases of the kidney, but not absolutely so.

5. Chloroform should not be given in the status thymicus.

6. In cases of vascular degeneration nitrous oxide is dangerous.

7. Watch constantly the respiration, pulse and pupils, especially the respiration, in the early stage of chloroform anæsthesia.

8. Avoid syncope by keeping the head low and turned to one side, and avoid pulmonary complications by keeping the head below the level of the body and allowing the mouth secretions to run out, and by preventing the chilling of the body.

9. In case of syncope raise foot of table (suspend patient head down if necessary), perform artificial respiration, massage the heart, make rhythmic contraction of tongue, use saline transfusion and enemas.

10. Hypodermics are of little use until the heart beats, but when available Atropine is a most valuable vaso-motor stimulant, especially in case of embarrassed respiration from pulmonary œdema.

11. Ether is the safest general anæsthetic (except in the special cases where it is contra-indicated).

12. Only a skilled anæsthetizer should be permitted to administer the anæsthetic.

In estimating the danger of the anæsthesia in throat operations we should remember that there is an unusual susceptibility to anæsthetics in the child in the adenoid state, and I believe a peculiar vulnerability to chloroform. I have practically given it up for such operations, as I have had several trying experiences with chloroform, and in the very earliest stages of its administration. The child suddenly stopped breathing, and in one case the heart was arrested, too. Fortunately I have never had a death from it, or from any anæsthetic, but the experience is distinctly unpleasant and disquieting. On the other hand, I have a few times been obliged to give up ether because of the irritation it produced in the respiratory tract. I have never operated under nitrous oxide. I am too slow, I presume. I read not long ago of an operator who cleared the vault of adenoids and amputated both tonsils during nitrous oxide asphyxia—all in about ninety seconds, if I remember correctly. This is too rapid for me.

The danger from hæmorrhage is very small in children, unless they

are bleeders, when it may be exceedingly dangerous and difficult to arrest. The use of the supra-renal preparations has reduced the danger of hæmorrhage to next to nothing. The amputation of the tonsils in adults may be attended with a severe hæmorrhage. For this reason, among others, I use the snare instead of the guillotine.

I wonder that pieces of adenoid or portions of the tonsils are not sometimes drawn into the larynx. Such an accident has never happened to me nor have I ever heard of its occurrence, yet it seems quite possible. I always think of it when operating, and guard against it, and am always prepared to perform tracheotomy should the necessity for it arise. Blood and secretions may be drawn into the lungs and cause pneumonia, though this is rare in the brief operations upon the throat which we are considering.

It is practically impossible to render the pharynx aseptic, yet sepsis after throat operations is, I believe, exceedingly rare, yet it is possible, and in estimating the dangers of the operations upon the throat it must not be overlooked. The tissues seem to have a high degree of resistance to germ infection, yet none the less we should render them as clean as possible before and after operation.

The dangers, then, of these simpler operations upon the throat prove to be few and of no great importance, yet we cannot truthfully say to the anxious father and mother that there is no danger at all. There is always some danger, and they should be made to understand that fact, but we can couple the statement with the assurance that with watchfulness, care and skillful methods the danger is so small that it should not deter them from giving to their child the great benefit which these operations afford.

DISCUSSION.

Burton Haseltine, M. D.: In the discussion of Dr. Hooker's valuable paper I shall follow the same general outline, and consider the subject under the same headings.

Anæsthetics: The chief characteristics of the various anæsthetics as given in the paper are well established and their recognition is of the utmost importance. The conclusions as stated should be retained in the memory of every operator.

The common effect of chloroform in lowering the blood pressure has suggested to my mind the administration of Adrenalin chloride as a safeguard. This drug is known to produce a marked increase in blood pressure, and its use before the administration of chloroform would seem to be a logical measure. My experience with it is still too limtied to

enable me to estimate its value, as this is a matter which can only be determined by trial in a large number of cases.

My practice differs from that of the essayist as regards the anæsthetic for adenoid operations in children. I almost always give chloroform, believing that there is less danger of subsequent inflammatory conditions in the respiratory tract than when ether is employed. I have not observed any special vulnerability to chloroform in these cases, but this is, perhaps, because of the unusual care with which I give it. I always take plenty of time in putting the patient under, increasing the amount of anæsthetic gradually and watching carefully for signs of trouble in the early stages. The practice of smothering a screaming child with the strong vapor of chloroform or ether is, I believe, a dangerous one. I do not operate under nitrous oxide, as I believe the time is too short for safe, careful and thorough work.

Hæmorrhage. The danger from hæmorrhage is not usually considerable in children, but in adults it is always an important factor. And it must not be supposed that topical applications can be relied upon to control such cases. I have had bleeding from arterial stumps after the removal of tonsils even with the snare, so persistent that it was only controlled by hæmostatic forceps applied as in any other wound, and left in position for hours.

Foreign bodies: My experience in this regard coincides with Dr. Hooker's, although, like him, I regard such accidents as possible and always to be thought of.

Sepsis: I have had no trouble from this scource, but I have seen many cases where results of operations had been disappointing owing to lack of proper subsequent care. I always insist upon seeing these patients frequently during the healing process, and keeping the rhinopharynx in the cleanest possible condition. I believe we can in this way often avoid trouble and contribute very materially to our good results.

Joseph Franklin Roe, M. D.: Dr. Hooker, in his valuable paper, seems to take as the most serious consideration in throat operations the old subject of anæsthetics. That he is just in this I believe the experience of every man here present would vindicate. However slight the operation, it is, after all, not a mere simple matter of going to sleep, but the actual paralyzing more or less temporarily of the entire sensory system. I believe the doctor has dwelt too lightly upon one other point of danger, namely, hæmorrhage. An experience in my own practice, which I shall ask permission to cite later, has naturally led me to this thought. So necessary are anæsthetices to our work that one hardly expects to do any adenoid operation absolutely thorough without the use of some one of them, and I wonder if there is a man here who sees his patient preparing for this slight and common operation by an anæsthetic who does not feel a slight increase of tension in his nervous system and realize the seriousness of the condition. It is then a question of what anæsthetic is safest, quickest and most satisfactory. Dr. Hooker favors ether, and in this he has a large amount of company.

New York men have been for the past three years rapidly swinging into this line, until now I believe it is a settled thing that ether is *the* anæsthetic where any anæsthetic shall be used in adenoids. It is not altogether improbable that in a few years the pendulum may swing to the other side, and we find these same men using the more pleasant anæsthetics, chloroform and gas. It was on my way here my privilege to spend an afternoon with a friend in one of the large throat departments in New York, and see several adenoid, and adenoid and tonsil operations under ether. Now I must not be considered as taking my measure from Binghamton when I say that I think some of the work done little short of barbarous. Why it is necessary to have the anæsthetic so prolonged and so profound that the patient is for several minutes choking, wheezing and inhaling and swallowing blood, as was the case in three of these operations, is more than I, who was taught under the old system (of be quick as you can and be thorough), can understand. Ether is not without danger. Of course it is much better for the surgeon that the patient should die a week after than on the table, but it is not so much easier for the parents and friends. Ether is kind to us in this way. To the very contrary with chloroform, if the patient leave the operating room or even comes out from under the anæsthetic we vote the danger past. It is quick, pleasant and seldom leaves the patient nauseated. If we eliminate from the death list of chloroform all the cases due to carelessness and incompetency we shall find its spectral face has taken on a more ruddy hue. The anæsthetist employed should be as competent for these cases under consideration as if he were to carry the patient through a two hours' operation. Every case should be carefully examined for any heart lesion. I use chloroform and nitrous oxide almost entirely, and have yet seen no dangerous effects or alarming conditions. Still I am aware that these do come in very rare cases without any warning, and that chloroform especially is not without danger. In young adults where adenoids alone are to be operated upon nitrous oxide has been most satisfactory. It may hardly give time for both adenoids and tonsils. In children it is more difficult to use unless you have the child's entire confidence. It is a favorite anæsthetic in Great Britain.

I believe the dangers from hæmorrhage are little alleviated by the use of Adrenalin, since the hæmorrhage may come on a few hours after the operation and be severe. May I ask time to cite one case from my experience?

Case.—Girl, age ten, fair, strong and ruddy; had been operated upon two years before, and parents would not return to former surgeon, since the child had nearly died from hæmorrhage at first operation. Fearing from this history possible danger, I painted the throat very carefully with an Adrenalin solution and operated under chloroform. I was especially careful to be thorough, since the adenoids had returned once. The patient returned home some forty miles from town, and early that evening I was called up by 'phone by the family physician, saying that

the patient was bleeding badly, and he began to despair of controlling the hæmorrhage. It was controlled, however, by the free use of gauze saturated in tannic acid solution, and packed up back of the palate. Three years later the same little patient returned to me with the vault of the pharynx literally full of adenoids. I operated under gas, and recalling the history of the previous hæmorrhage, had ready a mild solution of tannic acid in a large syringe. I never could see that an adenoid operation was especially picturesque or beautiful, but for liberal allowance of blood, this case held the record, and it was only after repeatedly syringing with a styptic solution that the hæmorrhage was controlled. I believe it a good thing to always have ready some solution of this kind for instantaneous use. Little precautions like this sometimes prevent bad attacks of insomnia in surgeons even though we *may be* a case hardened lot.

In closing let us observe:

Ether is not without faults.

We have worse friends than chloroform, I believe we have none better.

Gas is safe and most satisfactory where it gives time.

Any operation may be dangerous, but the results warrant the danger.

Examine the patient's chest carefully before operating.

Post mortems are instructive but disagreeable.

R. S. Copeland, M. D.: I think that this is a very timely paper, and I feel like thanking Dr. Hooker for presenting it. Until one has had a death from the anæsthetic he cannot properly appreciate the dangers. I have had such an experience and I know what it means to have a death on the table. I heard a physician say that statistics showed that anæsthesia was as nearly safe as anything could be. I can hold up my end of the argument and say that that is not so. The greatest care should at all times be exercised in the administration of the anæsthetic. I think that we are not careful enough in selecting the anæsthetic for each particular case; not careful enough of the particular bottle, for instance. I know of two deaths that occurred from the use of a particular bottle of chloroform. Examination showed that the chloroform had undergone degeneration and become poisonous. When chloroform is exposed to sunlight decomposition occurs, and it acquires a certain poisonous quality. Anæsthesia at best is a serious condition, but this adds a positive danger to it.

Sayer Hasbrouck: Personally I am very much in favor of chloroform anæsthesia, but it must be pure and of the best quality. I buy the best Squibb's, and decant it into one ounce bottles for use, never using a bottle after once opened, thus doing all that I can to have it pure.

Chloroform anæsthesia should never be undertaken except in a warm room. The value of this suggestion has been proven, I believe, by the investigation of the British Medical Association in India.

This last precaution is most important; if you take the trouble to investigate the accidents that have happened with chloroform, you will

find that they occurred with old chloroform, and I believe a low temperature. With pure chloroform and a warm room I believe you need not fear chloroform anæsthesia.

I have tried ether and I dread its irritation upon the mucous membranes in adenoid and tonsil operation.

H. S. Weaver, M. D.: I was very glad to hear this paper, as I deem it to be a very important subject. My worst experience came from chloroform when the patient, a child, had not had more than three or four breaths of the anæsthetic; not more than thirty drops had been put on the mask when the child stopped breathing and the pupils dilated. I had Dr. ——— present; he told me to go ahead and remove one of the tonsils, insisting that the removal would have a stimulating effect upon the nervous system and restore the breathing. I did so; there was not a drop of blood. We then elevated the child and it began to breathe. The mother of that child was a woman who was very sensitive to chloroform. On one occasion she went into a collapse after a short anæsthesia, and did not revive in spite of every effort for half an hour. This experience taught me to be careful and to have a good anæsthetist.

A. W. Palmer, M. D.: One very efficient method of reviving a patient which we too frequently overlook is to stretch the sphincter ani. I consider it more effective than artificial respiration.

C. G. Fellows, M. D.: Very little has been said about nitrous oxide anæsthesia, and, if the time permitted, I should be very glad to give my experience.

I have no serious results to report from the use of nitrous oxide, for, of course, I only employ it in short operations. Although we use chloroform and ether so generally, I find that a great many parents object to the greater risk of such anæsthetics after having been informed that the operation of tonsillotomy or adenotomy is such a simple matter, and so I use gas a good deal in these latter conditions. The administration of the nitrous oxide by means of an inhaler through the nose allows ample time for the removal of the tonsils and adenoids, and I have in one or two instances operated upon two members of the same family, not taking more than ten or fifteen minutes for both cases, including anæsthesia and recovery.

I employ a professional anæsthetist, who uses nothing but gas, and understands its administration thoroughly. I operate at his office with freshly prepared nitrous oxide, and insist that the patients remain a while before leaving the office, and then are taken home in a carriage and put to bed for the usual time.

J. H. Ball, M. D.: I have a feeling that is quite strong with me that I get greater security from the Trendelenberg position; there is less danger from bleeding and from strangling. The position ensures better cerebral circulation and is quite convenient for operations upon the throat and nostrils.

E. B. Hooker, M. D.: One of my objects in writing this paper was to call attention to the fact often overlooked, that the dangerous period of

anæsthesia is in the early stages when the patient has taken but a whiff or two. Cessation of the respiration is the first sign of danger. I thank Dr. Palmer for his reference to the stretching of the rectum. It is an excellent means of reviving a patient in danger from heart failure from whatever cause. I have had no experience with nitrous oxide. I have heard that the people are rapid in Chicago, and hence I am not very much surprised that they can take out everything that a patient has at a single sitting under nitrous oxide gas. It seems to me that if there were adhesions of the tonsils to the pillars of the fauces and a slimy mucous secretion, it would be extremely difficult to do so much in the few minutes that the nitrous oxide anæsthesia lasts. It would require unusual skill and ability. I want to emphasize the superior value of Atropine over Strychnine in failure of the respiration. I recently had an experience in obstetrics that convinced me of the truth of the statement. I still practice obstetrics, not being an exclusive specialist, and I had in the instance that I speak of the most severe case of difficult labor that I ever had in my life. It was a large child with the occiput lying to the mother's back, the first labor and a dry birth. I could at first not get that occiput to come round to the front. I delivered the woman under chloroform with the occiput in the rear up to a certain point and then turned it to the front with the forceps. It was a very tedious operation, very difficult and resulted in a severe laceration, involving the sphincter ani and a portion of the vagina. I was averse to repairing it at once owing to the bruised condition of the parts and the exhaustion of the patient. I believe in waiting for twenty-four hours and then making a good job of it. The consultant thought that it would be better to go ahead at once and repair the laceration. It was a most difficult operation, requiring time and manipulation. The woman shortly after went into a collapse that was alarming and prolonged. The first drug that I gave her was a hypodermic injection of Atropine. It increased the blood pressure by contracting the arterioles. The effect was prompt and beneficial. The cold sweat disappeared, the color came back and the pulse could again be felt at the wrist. While the heart is still moving at all and capable of carrying the drug into the circulation, it is by far the most powerful reviver and restorer of the energies that we have at our command.

INDICATIONS FOR THE USE OF REMEDIAL MEASURES IN TRACHOMA.

BY THOMAS M. STEWART, M. D.,

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THE remedial measures for the treatment of trachoma may for convenience be grouped in four classes:

1. Local.
2. Surgical.
3. Dietetic.
4. Internal.

The treatment of a case will often call for a judicious combination of two or more of these classes of remedies.

Local Measures.—In the inflammatory types of trachoma local measures are most beneficial. The retro-tarsal fold must be reached in all cases to insure thoroughness of treatment.

Aluminate and sulphate of copper, alum stick, glycerite of tannin, atropine, hydrogen dioxide, nitrate of silver and bichloride of mercury are the local remedies most successfully used.

On account of bad reactions from use of cocaine previous to use of solid remedies, the dipping of the copper or alum stick in glycerine renders its use less painful and equally efficacious. It is well to first attempt mild antiseptic treatment as an active inflammation in trachoma often favors absorption of the granulations. Hence, atropine alone, or atropine once a day and hot boric acid flushings four times a day are useful. Very active inflammation calls for cold compresses if the cornea is not involved.

Subsidence of the active congestion may not clear up the case, then the local measures of a caustic nature are indicated. If the copper or alum treatment is not well borne, glycerite of tannin in its official strength as recommended by Cowen is indicated.

Indeed, glycerite of tannin in Cowen's hands has accomplished more than any other drug. Its application is not painful, ten minutes after its use the patient can use the eyes. The painlessness is a decided advantage in young patients. The glycerite of tannin acts well in the

diffuse trachoma infiltration and also in the dry cicatricial form. Its application should be made once a day by means of a cotton swab, using friction to carry the remedy well into the membrane. The friction is mildly a surgical procedure as well. There are no contra-indications to its use. As with other local methods, the treatment must last a considerable time.

Friction with bichloride of mercury 1:1000 is helpful, particularly after surgical measures have been employed.

Schenck recommends the iodides of silver, and the formula as given by him at the meeting of this Society in June, 1900, is as follows:

Nitrate of silver.....1 part.
Glycerine .....2 parts.
Water .....1 part.
Mix to make solution No. 1.
Iodide of potash.....2 parts.
Glycerine .....4 parts.
Water .....2 parts.
Mix to make solution No. 2.

To five drops of solution No. 1 add ten drops of solution No. 2; the yellow, flaky, gelatinous mass resulting is to be appiled by a swab directly to the lids. It is followed by very little irritation, but marked results have been noted. Granulations are reduced, a normal condition of the mucous membrane is brought about. If pannus is present the cornea gradually clears. The solutions should be freshly mixed for each case.

Boracic acid rubbed on the anæsthetized lids by means of the finger covered with gauze is recommended by Rumsey. Boric acid with arnica or calendula is also recommended.

Formaldehyde solution, 1:5000, one drop in each eye every three hours, and increasing the strength of the solution as the eye becomes tolerant, is Moffat's excellent suggestion.

Payne reports excellent results from the use of Hydrogen dioxide rubbed into the lids and retrotarsal fold, after scarifying longitudinally.

The two things common to the use of the foregoing solutions are:

1. The retro-tarsal fold must be treated.
2. Friction is necessary.

Therefore, local treatment with solutions is of a mild surgical nature, because of the friction. This approaches the operation of expression if scarification is employed, and if the friction is pronounced Rumsey's method is decidedly surgical in character.

Surgical Measures.—The principal surgical methods are grattage, electrolysis, excision of a strip of conjunctiva containing the granules, curettement, peritomy, and the roller forceps operation of expression.

Grattage or friction with a stiff brush, the oldest and the worst surgical procedure in trachoma, has had a recent revival. Gratifying results with and without previously scarifying the conjunctiva have been reported. These good reports a few weeks after the operation may be modified because of cicatricial contraction sufficient to cause entropion. This operation has, therefore, been entirely abandoned by some operators.

Electrolysis is a valuable surgical procedure, because its results are satisfactory at once, improvement is uniformly continuous, and patients are able to discover the improvement very promptly.

Electrolysis is valuable in those cases presenting enlarged papillæ. Such cases are not benefited by the roller forcep operation unless the conjunctiva is scarified.

The copper electrode should be a delicate flat blade and attached to the positive pole. Then using from one to three milliamperes of the galvanic current lightly, brush the diseased tissue including the retrotarsal fold. The negative pole may be applied to back of neck or held in the patient's hand, depending upon the intensity of the current desired.

The electrode should be constantly moved during the application of the current, and it is perhaps better to cover it with cotton mixed with plain water, unless it is the desire to deposit the copper more deeply in the tissues, in which case salt water should be used.

The only other valuable surgical measure is that of expression, unless it be the operation of syndectomy, valuable in case pannus persists after the trachoma has been cured.

Expression is only valuable in the simple or non-inflammatory types of trachoma.

To secure the best results an anæsthetic should be used, as the operation is painful as well as protracted. Knapp's roller forceps for the body of the lid and cilia forceps for the lids near the canthi are effective instruments.

After all surgical procedures cold compresses are grateful. And the eyes should be flushed several times a day with boric acid solution. After subsidence of the inflammation excited by the operative procedure, local treatment will be necessary until all hypertrophy of the conjunctiva has disappeared.

Dietetic Measures.—Because of relapse common to all methods of treating trachoma, it is necessary to correct all hygienic and dietetic errors at the beginning of treatment, and to establish such correct habits that the patient may guard himself against recurrence of the disease at some future period.

Indeed, not a few cases can be cured in this way alone. At our meeting in Washington in 1900 we had the honor to present a paper upon the "Dietetic Management of Trachoma," and later experience confirms the writer in the great value of attention to diet, not alone in the treatment and prevention of trachoma, but its paramount importance in all diseased conditions.

Extended remarks upon this topic is out of place at this time, except to say, warm food with less of meat than vegetables, and particularly a variety in vegetables and fruits; water, a quart a day at least, in small frequent doses between meals; a regular time to move the bowels, and care in the use of sweets and pastries; fresh air, deep breathing and exercise are good general rules.

The books on dietetics will give the needed knowledge of chemistry and food values to enable one to gain greater facility in detecting errors and prescribing rational treatment.

Internal Measures.—Internal measures comprise medicines and tonics to aid in correcting faulty action of the internal organs.

The remedies most often indicated are:

Aconite, Argentum nitricum, Alumina, Aurum muriaticum, Arsenicum iodatum, Mercurius proto-iodide, Natrum muriaticum, Pulsatilla, Rhus toxicodendron, Sulphur, Psorinum and Thuja.

It is not necessary before this Society to reiterate the indications of the foregoing drugs. Very often the general condition of the patient calls for a skillful estimate based on a physical examination of the vital organs, of the exact general condition of the patient and his reactive powers. Needless to say equally skillful treatment will be called for, taxing to the utmost, at times, the physician's resources.

DISCUSSION.

Frank D. W. Bates, M. D.: I have had pleasure in reading Dr. Stewart's paper on Trachoma. He has covered the ground pretty thoroughly, and so far as local treatment is concerned I can neither find fault with same nor offer any suggestions.

In my own hands the most benefit from local remedies has been obtained from Nitrate of silver and Glycerite of tannin, together with

regulation of the diet, plenty of fresh air and exercise, and freedom from dust and smoke.

But the most important thing to my mind in the treatment of a case of trachoma is to ascertain if possible the factors engaged in producing same; and it seems strange to me that in reading the treatment recommended by various authors on this disease we never see anything mentioned about the refraction.

What is the cause of trachoma? It is said to be the result of a dyscrasia. Perhaps it is; but if so, why is it that we frequently have it confined to one eye, the other seeming to have no tendency to same?

To mention a case in point, I have a case on my hands at the present time, a girl of fourteen, who came to me some four months ago with trachoma confined to the left eye. No consumption in family so far as they know. Sister, aged twenty-three, has epileptic fits. (On examining the eyes of latter found compound hyperopic astigmia with considerable muscular trouble.) Patient's left eye has been irritable for years, but had gotten considerably worse during the few months previous to her coming under my care. Mother took her to the hospital before bringing her to me, where the trouble was pronounced trachoma, and they wanted to operate upon her, which the mother would not consent to.

I found the granulations very numerous in the left eye, but apparently no tendency to same in the right.

Upon examining the eyes I found V = o. d. $^{15}/_{20}$ O. S. $^{15}/_{40}$ with + 25 D. — .25 D. C. 135° V = O. D. $^{15}/_{15}$, with + 25 D. — .75 D. C. 135° V = O. S. $^{15}/_{20}$. After paralyzing accommodation V = O. D. $^{15}/_{70}$ O. S. $^{15}/_{70}$ n with + 1. D. ⊂ + 25 D. C. 75° V = O. D. $^{15}/_{15}$ with + 75 D. ⊂ + 75 D. C. 65° V = O. S. $^{15}/_{20}$. After paralysis wore off prescribed as follows:

O. D. + 25 D. ⊂ + 25 D. C. 75° O. S. + .50 D. ⊂ + .75 D. C. 65°.

Two days after commencing the above glasses she was taken with a violent attack of iritis in the left eye, which it took me six weeks to subdue. I should have said that while the accommodation was paralyzed the eye cleared up so that it was better, the mother said, than it had been for years.

As the iritis subsided latent hyperopia began to develop, so that before I discontinued the Atropia, with + .2 D. ⊂ + 1. D. C. axis 10° V = O. S. $^{15}/_{15}$, which glass I put on before discontinuing the drops, expecting to have to reduce the spherical; but she is wearing the same glass today, and the granulations have entirely disappeared. The last time she was up I found she would even accept .50 D. more spherical. Notice that the axis of cylinder with the development of latent hyperopia changed from 65° to 10°. I do not know how to account for this, but the fact remains. While speaking of the development of latent hyperopia, if you will bear with me one moment for digressing, a young lady, aged twenty-two, consulted me last July, Had been wearing + .50 D. spherical for two years previously for reading and sewing only; but though she could see well with them the head

would ache if using the eyes long for close work. Lids were irritable, and there was some photophobia, especially for sunlight, so that she at times wore smoked glasses.

I paralyzed the accommodation and prescribed the following glasses to be worn constantly:

O. D. + .75 D. ⌣ + .50 D. C. 80°.
O. S. + .75 D. ⌣ + .25 D. C. 90°.

These glasses gave her comparative comfort for a time; but last February she came back to me, saying that they did not give her the relief that they had, though she could not do without them at all. Upon examination I found a remarkable development of latent hyperopia, the manifest findings being:

O. D. + 2.25 D. ⌣ + .50 D. C. 80°.
O. S. + 2.25 D. ⌣ + .25 D. C. 90°,

which glasses I prescribed for her, and with which she has perfect comfort since, there being no irritability of the lids and no photophobia. In this case there was no change in the amount or axis of the astigmia.

To return to the first case, whether I would have found latent hyperopia in the right eye by a prolonged paralysis of the accommodation I do not know, but think not, as none has developed by wearing glasses, and the eye gives her no discomfort; and furthermore, there is not the slightest irritability of the lids of the right eye, which in her case I think there would be if there was much latent hyperopia or uncorrected astigmia. The only local treatment used in this case, except when she had iritis, was a weak solution of bichloride, 1 to 5:000, with a little calendula.

I remember an instance some three or four years ago when I had three cases of trachoma in one family, the mother and two sons, one fourteen and the other eighteen years of age. The eldest son had had the trouble for some years, but the mother and youngest son developed it suddenly. Upon examination I found that every one of them had hyperopic astigmia of a high degree, as follows:

Mother—
O. D. + 1.50 D. ⌣ + .75 D. C. 100°.
O. S. + 1. D. ⌣ + .75 D. C. 90°.

Eldest son—
O. D. + 1. D. ⌣ + 1.25 D. C. 150°.
O. S. + 1. D. ⌣ + 1. D. C. 30°.

Youngest son—
O. D. + 2. D. C. 90°.
O. S. + 3. D. S. 90°.

I prescribed glasses for all of them, and with mild local treatment and care they all made complete recovery, and have had no return of the trouble since.

A few days since an English woman, aged thirty-three, consulted me with trachoma, who had only been in this country for about six weeks. Says her eyes have troubled her off and on for years. Has had various

applications made to them and they would get better for a time and then worse again. Never had glasses prescribed or suggested for her. Upon examination the manifest findings were:

O. D. — 1. D. C. 150°. O. S. — 1.25 D. C. 60°.

Upon paralyzing the accommodation found latent hyperopia in O. D. of 2. D., but none apparently in O. S., though left eye she says, has always troubled her most. Told to continue the drops and report again in three days. The irritability of the eyes in this case, as it is in all cases that I run across, was very much relieved by the Atropine. Now I have brought this matter up to elicit discussion; for if strain upon the ciliary muscles is a factor in producing trachoma it should be taken into consideration in the treatment of same. The tendency to recurrence of the trouble after various local and surgical treatment, where glasses, or the proper glasses have not been prescribed, together with my own experience, leads me to believe that it is. We have all had cases of irritable lids which we have relieved by prescribing the proper glasses; now is it not possible that the difference between these irritable lids and trachoma is in degree only with perhaps a dyscrasia behind the latter? There is no recognized specific germ for trachoma, nor is it as contagious as it has been generally supposed to be.

If strain upon the muscles of accommodation have nothing to do with trachoma, why is it that we always get more or less relief from the use of Atropine?

It has been my custom of late years to paralyze the accommodation the first thing in such cases and correct the trouble with refraction as accurately and fully as possible, and then give local and other treatment afterwards; and I have had good results. Of course, in cases where there is pannus we cannot do this; but if I can clear up the pannus by local means as soon as it is sufficiently clear to do so I prescribe glasses.

W. W. Blair, M. D.: The treatment of trachoma appears to me to be at present in a rather uncertain state. To glance over Dr. Stewart's paper one might think that to treat a case of trachoma were an easy matter; that with so many remedies at hand one would have but to select from the rich store there spread out and proceed to cure the case. But alas! how often are we forced to ring the changes on the entire list for medicinal, dietetic, operative and local measures before we can note that our case shows any response, and then, too, the very multiplicity of the remedial agents recommended suggests weakness on our part. In fact, our treatment of trachoma today does not rest upon a satisfactory, scientific basis, and the reason of our weakness is ignorance of the cause; we are all ready to admit that trachoma is infectious, and today infection implies a germ; now until that germ is isolated and placed in a position to be studied our treatment must rest where it is, on an empiric basis. Understand me, I do not belittle the results achieved by the many methods of treatment at hand, but until we can say what form of treatment will benefit a type or a stage of the disease I feel that there

is a vast field to be worked over. Whether bacteriology shall solve the question remains to be seen. As our great leader, Hahnemann, himself continually urged we must find the cause, and until that cause is found we must continue to work in the darkness which is illumined only by the light of experience.

To add to the list of remedial measures already submitted in Dr. Stewart's paper would seem superfluous, and yet reports have been coming in from many sources recounting at least some hopeful results from the use of the Roentgen ray in this condition, that I am constrained to add my experience to the whole in the hope of eliciting the views of fellow members in this line.

During the past three months I have been treating a series of cases in my hospital service by means of the X-ray, and have been much interested in the results, as it was a new thing, and my having scant directions to go by, it was but natural that we should make some mistakes, getting quite a severe reaction in some instances. The method now in use, however, is briefly as follows: The face is protected by means of a lead foil mask, with apertures cut out for the eyes, and the treatments are given tri-weekly; the exposures are comonly about four minutes, at a distance of twelve inches. As is always the case, no fixed rule as to frequency or distance can be given, for as has been found in the use of the X-rays elsewhere, some patients exhibit a marked intolerance to its action, and a bad burn in this locality would be apt to result disastrously. The immediate effects are lachrymation and photophobia, and sometimes severe pain, which lasts from two to three hours; in certain cases this reaction was quite severe, and others comparatively slight. My own impression is gathered from the limited number of cases that the severer the reaction the more rapidly the case cleared up, the difficulty being to know how long to expose and how frequently; in other words, how much reaction we dared risk, but of course that is a matter for individual preference and discretion.

Mayou, in London, began treating his cases by exposing the everted lids to the rays, but has recently abandoned that method and contents himself with applying the rays through the closed lids.

Asked as to how the X-ray produces the results here set forth I am not able to make a very clear reply; by some it is set down as a neurotrophic action in which normal tissues are stimulated to renewed vigor, while abnormal tissue being possessed of less resisting power retrogades and disappears. Others claim that this result comes about simply as the result of the endarteritis which is set up. So far I can report one case as cured, "and this one, by the way, appeared to be most intolerant of the treatment during the time he was undergoing it," and a second one as much improved; two others were slightly improved. The cases noted were all of a severe type, pannus being present in all but one. As I mentioned above, my experience in this line of work has been limited, but I have already found sufficient results to encourage me to go on with the investigation further.

In the line of local application I am glad to see that Dr. Stewart has mentioned the old-fashioned Glycerite of tannin, which has fallen into disuse somewhat of late. I have found it to give great satisfaction, but do not think that it is of much value unless applied directly to the everted lid on an applicator and with some force. Argyrol used in exactly the same manner I have found to be equally efficacious, and is to be recommended on account of its non-irritating qualities.

J. B. S. King, M. D.: The criticism which I have to offer on Dr. Stewart's excellent and concise paper does not relate to any of the measures advised in particular, but only to the implied order of their sequence and importance. These are, according to Dr. Stewart:

1st. Local.
2d. Surgical.
3d. Dietetic.
4th. Internal.

I would change this order, thereby indicating the sequence that is wisest, and at the same time the relative importance of the various measures to

1st. Internal.
2d. Dietetic.
3d. Local.
4th. Surgical.

My reason for making this reversal is that unless the internal homœopathic remedy is given a free field it might as well not be given at all.

It acts from the inside out, by setting up internal processes, by changing both functional and organic, than begin from within, and it is frequently, very frequently the case, that the external manifestation of the disordered state undergoes a temporary irritation or aggravation, which is a necessary part of the restoration of health, and which when interfered with retards the cure.

As an instance, I cite an indolent chronic ulcer on the skin, a condition that admits of comparison with trachoma. The patient was an old German, poorly nourished, filthy in surroundings; the ulcer looked as if smeared with dirty brown lard. Under the action of *Sulphur,* which was indicated by three or four prominent symptoms, it became furiously angry; it turned from dirty gray to an ugly purple; from an ugly purple to a fiery red; from a fiery red to a handsome pink, and then began to cicatrize, and went on to complete healing, the whole process taking about eight weeks. Any scraping, any astringent, stimulating or caustic applications would, in my opinion, have interferred with this most beautiful cure, and at least would have been unnecessary, for nothing could have been better. I believe, then, while the homœopathic remedy is acting it is best to restrict the local measures to cleanliness alone. When you have satisfied yourself that such measures are ineffective, it is time to bring in the third indication, *i. e.,* Cupric sulphate, stick alum, Glycerite of tannin. This last, I would say, can be made 20

per cent. stronger than the officinal Glycerite with advantage, Argentum nitrate or Bichloride of mercury.

Fourth and last, all others having failed the surgical procedures would be appropriate. My criticism, therefore, is not to find fault with any of the measures so concisely described by Dr. Stewart, but with the order and sequence in which they are used.

D. W. Wells, M. D.: In regard to the use of electrolysis in this chronic condition of the eye, I would like to call attention to an article printed in a recent number of the *Ophthalmic Record.* The writer uses negative pole with fine platinum electrode. This obviates any destruction or scarring of the conjunctival epithelium, the alkaline caustic dissolving the granule itself. One or two punctures may be made in each granule, and a dozen or more at a sitting, as there is very little irritation after cocainizing.

C. L. Rumsey, M. D.: I would like to ask Dr. Blair how often the applications mentioned in his discussion were made?

W. W. Blair, M. D.: At first tri-weekly, and then twice a week.

AFFECTION OF THE GLOSSO-EPIGLOTTIC AND PYRIFORM SINUSES AND THEIR TREATMENT.

BY CHAS. E. TEETS, M. D.,

New York City.

IN most of the works on diseases of the nose and throat no mention is made of the glosso-epiglottic and pyriform sinuses. In the most recent works affections of these sinuses have been overlooked or their importance not appreciated. Why this is so and why more attention has not been paid to the changes which take place in these sinuses I cannot understand, because they are often the cause of reflex symptoms and diseases of other parts of the throat. Silas Cohen recognized affections of these sinuses and mentioned them in his book, which was published in 1879. He reports several cases of supposed chronic laryngitis, one which had received treatment at several of the large hospitals without any permanent relief. He made a laryngoscopic examination and found that the inflammation was due to ulceration in one of the pyriform sinuses. This case was permanently cured by a few applications of the nitrate of silver.

Holbrook Curtis in a paper on "Acute Laryngitis of Singers," published in the April number of the *Laryngoscope,* advises for paresis of the thyro-arytenoidiei muscles, which usually accompany laryngitis, swabbing the pyriform sinuses with the tincture of iodine and glycerine in equal portions. He claims this stimulates the nerves and produces a counter-irritation without the vocal larynx.

Before proceeding any farther. I would like to say a few words as to the location of these sinuses, and the best method of examining them. The glosso-epiglottic sinuses or lingual fossæ are depressions between the epiglottis and base of the tongue. They are situated one on eash side of the median glosso-epiglottic fold, which is a small membranous covering enclosing the glosso-epiglottic ligament and stretching from the middle of the lingual surface of the epiglottis to the raphe of the tongue. They are bounded exteriorly by the mucous membrane of the sides of the tongue, called the lateral glosso-epiglottic fold, which sometimes in the

living subject is hardly perceptible. In some subjects they are shallow but oftener depressed.

The triangular pharyngo-laryngeal or pyriform sinuses are located outside of the aryepiglottic fold, and, therefore, external to the larynx proper; they are situated one on each side of the larynx, between the aryepiglottic fold and inner surface of the wing of the thyroid cartilage. Each sinus begins at the free border of the respective epiglottic fold, the upper portion of each sinus being broad and looking forward, but as it descends it becomes more and more conical, and is finally lost at one end of the transverse furrow which marks the commencement of the œsophagus. Along the floor there is a chain of glands which is often involved in diseases of this part.

Vohsen believes that the pyriform sinuses can be more satisfactorily examined on phonation, and when the head is slightly turned to the opposite side. I have found, however, that I got a better view of all parts of these sinuses by turning the head slightly to the opposite side and having the patient inhale and exhale quietly.

Upon inspection with the laryngoscope both the glosso-epiglottic and pyriform sinuses are sometimes seen entirely empty, but fequently we find them filled with a greater or less copious secretion of mucous, which hides the diseased area or the foreign substance from view, therefore, before the parts can be properly examined of the cause discovered, it will be necessary to wipe away the mucous. This is best accomplished by means of a small sponge or absorbent cotton, which being firmly fastened to a holder will absorb the fluid.

Bits of thread broken off in sewing, bristles from a tooth brush, fish bones, etc., sometimes find their way into these sinuses, and being hidden from view often remain for a long time, causing not only an irritation and cough but frequently ulceration. Ulceration in one or both of these sinuses occasionally occurs from injury in swallowing small particles of bone or crusts of bread, which sometimes tear the mucous membrane in their passage to the œsophagus. These sinuses are not unfrequently the site of tubercular or syphilitic ulcerations, which are overlooked for a long time because the affected spot is covered with mucous. Ulcerations give rise to irritation, a pricking sensation and pain, which is more particularly felt in swallowing, coughing and from any movement of the parts, such as extending the tongue. Occasionally an engorged capillary will be found in these parts and they produce not only cough, but a pricking sensation during the act of deglutition. The glands at the bottom of one of these sinuses will

sometimes be the starting point of an inflammation, which if left untreated, will in time extend to the neighboring parts. Even while the inflammation is confined to the sinuses, the patient will complain of irritation and pain, and it is surprising what relief is experienced from one application of nitrate of silver, 60 grs. to the ounce.

I could cite a number of cases where foreign bodies were removed from these sinuses. I recall one case in my practice of a young lady, who, supposing she had swallowed a pin, came to me to have it removed. Upon examination with the laryngoscope, I discovered, lodged in the glosso-epiglottic sinus, a large compressed tablet, which had rested here instead of passing into the œsophagus, and not being readily dissolved, had remained there until removed with the forceps, which gave prompt relief.

Foreign bodies give rise to a pricking sensation on swallowing, and sometimes cough. They should be removed with the forceps and an application of nitrate of silver, 40 grs. to the ounce, made to the sinus. If ulcers exist, after the sinus has been carefully wiped out, the ulcers should be touched with nitrate of silver, 60 grs. to the ounce, or sulphate of copper in the same proportion. Engorged capillaries can best be treated by the galvano-cautery. I have also had good results from repeated applications of the fluid extract of geranium maculatum.

A careful examination of these sinuses should be made, as there are a number of cases on record in which long-continued throat disease had resisted topical applications to the interior of the larynx, until the laryngoscope revealed the disease to be due to ulceration in one of these sinuses. There are many cases in my own practice, which I will not take up your time to report, where treatment directed to these sinuses gave prompt relief after local applications made to other parts of the throat had failed.

Cohen says that the importance of always examining them cannot be over-estimated, and reports a case of a mother of three children who applied to him in November, 1866, with a sense of pain across the throat as of a sharp foreign body. The pain was constant and increased on swallowing, especially with acid substances. There was slight expectoration of mucous. After failing to get relief in private practice during eight months, she entered one of our hospitals, where her neck was blistered to no purpose. Her general health being good the physicians made fun of her at first, then treated her for bronchitis, after that for neuralgia, and finally determined that her disease was a

waywardness of pregnancy. She had become much emaciated from mental anxiety. Examination revealed ulceration of both glosso-epiglottic sinuses, especially of the left side. A few applications of sulphate of copper, 60 grs. to the ounce, cured her complaint.

DISCUSSION.

J. B. Garrison, M. D.: Dr. Teets is to be commended for calling attention to the necessity for examination and treatment when the occasion requires of the glosso-epiglottic and pyriform sinuses. The spaces are frequently overlooked and irritations permitted to exist that might be readily cured are unnoticed.

I have found many a distressing cough to be due to a hypertrophy of the glandular bodies existing in the glosso-epiglottic sinuses. In a recent case where a prominent physician found it almost impossible to continue to give a course of lectures before class in college, on account of the tendency of cough after a few minutes of talking, the removal of considerable hypertrophied glosso-epiglottic glandular tissue gave prompt relief. Not only this, but a continued deafness in the left ear for some time, was *immediately* cured upon the clipping off of one of the enlargements on the same side. This latter cure was purely accidental, for I had no idea that deafness could be caused by such a condition. The doctor exclaimed the instant that the instrument was removed from the throat, "Why, I can hear again." This serves to impress the necessity for always examining the out-of-way places in the throat. Make it a routine practice, and many cases will be found that will respond to the proper treatment which otherwise might be pronounced incurable.

The pyriform sinuses are a little more difficult to examine than the glosso-epiglottic, but a little practice soon enables one to see them without difficulty. Some patients show them better when phonating, while others will do beter in that respect when inhaling and exhaling quietly.

A weak solution of carbolic acid in glycerine is also beneficial to apply to these sinuses when they are the seat of ulceration or irritation.

Isaac C. Soule, M. D.: This paper is one of those which are valuable to us because they incorporate the essayist's experience, and I wish to thank the doctor for the pleasure which the study of his most excellent paper has afforded me.

One of the first difficulties encountered by the seeker for more light on this subject will be the confusion in the nomenclature. One writer using three terms to designate the pyriform sinuses in his description.

I have found that a very satisfactory way of examining these sinuses is to use a long flat-bladed tongue depresser, whose distal end has been curved downward at almost right angles.

By exerting pressure in a downward and forward direction the glosso-epiglottic sinuses are easily exposed for examination and treatment.

If, now, patient be directed to turn the head slightly toward the side to be examined, and the tongue depressor be placed a little to that side of the median line of the tongue, and a diagonal downward and forward pressure be made toward the opposite side, the pyriform sinus of that side will be exposed almost as satisfactorily.

This method in my hands has been preferable to the use of the mirror, as it leaves the other hand free, the parts are better illuminated and under direct inspection, no mean advantage when attempting to grasp a small splinter of tooth-pick, fish bone or use the galvano-cautery.

In acute laryngitis, especially if there is a troublesome cough, much relief may be obtained by an application of a 30 per cent. solution of argyrol to the sinuses under discussion.

C. E. Teets, M. D.: I am very sorry that there was not more discussion, as my idea was not so much to give information as to receive it. It seems to me that there should be more attention paid to this subject. I want to emphasize what was said about Thuja; it is the most successful treatment for papillomatous growths. An excellent way to destroy these growths is to apply Chromic acid fused on the end of a probe, and have the patient use the Thuja both locally and internally at home. When this is done I believe that the growths will never return. I had one myself about thirteen years ago, which was removed by the forceps. Chromic acid was afterwards applied and also fluid extract of Thuja, and the growth has never returned. I have treated at least forty cases in the same manner without a single recurrence.

C. G. Fellows, M. D.: I should like to ask for something more definite about the subjective signs and symptoms of ulceration of the pyriform sinuses. After making a laryngeal examination we ought to be able to tell, but the subjective symptoms should point to the location of the trouble, if it is possible to have them outlined distinctly. I have a patient now who is suffering from a swollen, stiff tongue, which hurts him in moving it as by talking or swallowing, and the only objective sign that I can see is a laryngeal varix. Are the symptoms of the two similar?

C. E. Teets, M. D.: I do not know of any other symptoms of ulceration besides those given in the paper, a pricking sensation and pain on moving the tongue of a persistent character are the main ones.

If I should meet a patient with a swollen, stiff tongue I should immediately look for ulceration at the side or base of the tongue, where ulceration is frequently overlooked. A slight application of Nitrate of silver to the spot would immediately relieve the pain.

TINNITUS AURIUM.

BY E. H. LINNELL, M. D.,

Norwich, Conn.

WHEN our president asked me to suggest topics for discussion at our gathering, I mentioned, among others, "tinnitus aurium," because that is a condition in the treatment of which I have had but indifferent success, and yet it is a very frequent and annoying complaint, and I hoped to learn of more satisfactory methods of treatment. When, in reply, he asked me to write upon the subject, I at first demurred, but finally consented to do so, thinking I might perhaps in this way still better achieve my object. So I want to preface my remarks by saying I have no new methods to offer, no unusual successes to chronicle. I have tried simply to give you a resume of the subject of subjective auditory sensations, with the hope that it may elicit profitable discussion.

Tinnitus is not a disease in itself, but a subjective auditory sensation, associated with a variety of pathological states. It may accompany almost any diseased condition of any portion of the hearing apparatus, from an eczema of the auricle, or an impaction of cerumen, to an otitis interna. It may be a reflex neurosis, from an enlarged turbinated body, a trigeminal neuralgia or hemicrania for instance, or it may be of central origin, denoting an irritation of the auditory cortical centre. In a given case, presenting itself, therefore, our first consideration should be with the etiology. We should ascertain the condition and functional activity of the various structures concerned in the reception and transmission of sound waves. In general, tinnitus may be regarded as an expression of increased intra-labyrinthine pressure, causing irritation of the terminal filaments of the auditory nerve. This in turn may be due, as has been suggested, to simple congestion, to the pressure of inflammatory products, either on the membrane, as in acute myringitis, or in the tympanum, to closure of the Eustachian tubes, or to some other cause inherent in the associated pathological condition. The cause being recognized, the annoying tinnitus can frequently be cured by its removal.

The character of the noise, its pitch, duration, location and apparent direction may at times aid us in arriving at a diagnosis of its causation and in our prognosis. A fluttering sound as of the wings of insects is suggestive of a spasm of the tensor tympani. In cases of this kind observers have sometimes been able to recognize simultaneous movements of the drum membrane. A sound like a ticking or grating may be caused by the movement of the ossicles, whose articulations are stiffened. Crackling or crumpling sounds result from the agitation of a dry membrane. When resulting from the sudden separation of agglutinated surfaces, the sounds are sometimes described as opening and shutting. Frequently the noises are at first intermittent and of low pitch, becoming more continuous and louder as the case progresses.

The sound is usually located by the patient in the ear itself. When it seems to move from the cranium toward the ear, the prognosis is said to be more favorable than the reverse.

Since there are no objective signs by which we can determine the pitch, intensity or other quality of the sound, we are entirely dependent for such information upon the statements of the patients. These will vary greatly according to the education, occupation and environment of the individual, and hence are not reliable guides in determining the character or cause of the subjective sensations.

It is a singular fact which I have never heard satisfactorily explained that "deaf mutes, who still retain a certain degree of hearing power, seldom have subjective auditory sensations, even when morbid changes exist in the ears, which ordinarily are associated with tinnitus." It is also true, I believe, that children seldom complain of noises in the ears. Is it because their tissues are more elastic and yielding, and thus that the pressure within the labyrinth is less easily augmented?

Middle ear catarrh, especially in the dry, adhesive, or so-called proliferous forms, is very frequently associated with tinnitus, and it is often the earliest symptom complained of. This association is by far the most frequent one with tinnitus, and the least amenable to treatment. When occurring late in the course of the affection or continuing uninterruptedly in spite of treatment, it is of bad prognostic significance, indicating, usually, permanent changes at the fenestræ or some labyrinthine affection. On the other hand cessation of noises late in the course of a middle ear catarrh is also an indication of probable involvement of the labyrinth, signifying in the one instance an irritation, and in the other an obtunding of the nerve fibres.

An accurate diagnosis of a labyrinthine affection is important, but difficult. The impairment or loss of bone conduction does not justify a diagnosis of labyrinthine mischief, for disease of the bones may impair their conductivity, and it is very difficult, if not impossible, to test the conduction through the bone alone eliminating the effect of simultaneous entrance of sound waves through the meatus. Hence *loss* of cranial conductivity offers no greater certitude of derangement of the labyrinth than does the *existence* of cranial conduction of the integrity of the labyrinthine structures. Tuning forks of various pitch, Weber's and Rinne's tests, afford valuable evidence, but a discussion of the methods of diagnosis of an affection of the inner ear is not within the scope of this paper.

A distinction should be made between a labyrinthine affection or an otitis interna, and so-called "nervous deafness," which latter is a pure neurosis, associated with neurasthenia, hysteria, anæmia, general debility, over-fatigue of the auditory nerves, etc., or of reflex origin. Noises due to a neurosis are curable by attention to the underlying constitutional condition or primary disease. Deafness in such cases may, or may not, exist in connection with the tinnitus. No demonstrable objective signs of disease exist in the auditory structures.

When the noises seem like human voices, words, conversation, etc., we may diagnose a mental derangement either existent or imminent.

By far the most numerous cases of tinnitus, and those which tax the skill of the aurist to the utmost, are those associated with chronic catarrhal inflammation of the middle ear. We meet these every day, and unless your experience is quite different from mine, they are most unsatisfactory cases to treat. Sometimes tinnitus is the earliest symptom of this disease, and in other cases it is a late manifestation. The treatment of the subjective noises is essentially the treatment of the underlying morbid process, but the tinnitus is very often the most distressing symptom, and the one for which the patient first consults the aurist. Frequently the deafness is at first unnoticeable. What can we do for such cases? You are familiar with the ordinary treatment. Inflation with or without the injection of stimulating solutions through the catheter is useful in the earlier stages. Various medicaments are employed in this way, for instance, ether or chloroform, 2-4 parts, to 10 of glycerine, or 10 grains of the muriate of Pilocarpine in an ounce of sterilized fluid vaseline. Of this four to ten drops may be injected, but ought not to be repeated more than once or twice at short intervals. The following may sometimes be helpful, viz.: Fifteen grains each of

Natrum carb, and Natrum iod., in an ounce of water. Proper attention should of course be given to nasal and naso-pharyngeal catarrhal conditions, hypertrophy of the turbinated tissues, deviated septa, etc.

Local applications in the meatus, such as the solutions of ether or chloroform already mentioned, or the following, viz.: Camph., 10 parts; Ol. menth. pip., 1 part; Ol. amyg. dulcis, 10 parts, are sometimes useful. Houghton reommended the instillation of equal parts of fluid vaseline and sul. ether as of decided service in a large number of cases. The same remedies made into an ointment and rubbed onto the mastoid or inserted into the auditory canal, and the application of vesicants and dry cupping to the neck, have their advocates. The following ointment has been recommended, viz.: Ammonii sue potasii iodati, gr. 30; camph., 1-4 gr.; Ol. menth. pip., gr. 15, and ung. simp., 2½ oz., a piece the size of a pea rubbed into the mastoid for five minutes twice a day.

Massage administered by different methods has been largely used of late years for the relief of deafness and tinnitus, and has had its enthusiastic advocates. I have had some gratifying successes with it and more failures, and I presume this has been the experience of most aurists. It is capable of aggravating both the deafness and the subjective sensations by its careless or indiscriminate use. I believe it to be contra-indicated when a pronounced implication of the labyrinth exists. Palliative remedies such as Hydrobromic acid, Opium, Chloral, Cocaine and the like are sometimes used, but with me they are a *dernier ressort* and unsatisfatory. Our homœopathic remedies are of much service in the earlier stages of the disease, but have disappointed me in old standing cases, especially as far as the relief of tinnitus is concerned. They should be carefully studied and always given faithful trial in connection with the other treatment, local and mechanical. Indications based upon the peculiar character of the subjective sounds are unreliable. Undoubtedly the treatment by the homœopathic remedy combined with inflation and massage skillfully and cautiously used offers the best hope of success, but how often these are all disappointing is too well known to all of us. One cannot prescribe satisfactorily for the one symptom of tinnitus, but the following remedies are especially to be remembered and consulted, viz.: *Bell., Cham., Calc., China, Chenopodium, Hydrast., Hep., Merc., Nux, Puls., Ferr phos.,* and *Gels.* In labyrinthine affections Quinine and Salicylate of soda and Iodide of potash are homœopathic. In reflex tinnitus *Pic. acid,*

Ferri pic., Sal. acid, China, Plantago, Hyos., and *Sepia* are to be thought of.

Electricity either alone or combined with massage is sometimes of benefit. My experience coincides with that of another writer, who says:

"Galvanization is capable often of temporarily relieving or removing subjective auditory sensations, but permanent cure is very rare. The noises return in a few hours and are sometimes aggravated. The Faradic current would be more useful when pathological changes are present in the muscles. Electricity may be useful when general nervous conditions exist, which are benefited by electricity, but it is of doubtful efficacy in primary disease of the auditory nerve." I should like to hear the results of the use of the high frequency current and the sinusoidal current by those who have used these forms of electricity. I have personally had no experience with them.

Finally the subject of surgical interference, mobilization of stapes, perforation of membrana tympani, and ossiculectomy may be considered in intractable cases.

Politzer refers to a form of nervous tinnitus, with or without deafness, which is sometimes encountered. It is a pure neurosis without demonstrable objective signs of disease of the sound conducting apparatus. It occurs in nervous, excitable individuals, in over-strained mental conditions, after trouble, in conditions of nervous and physical debility, with anæmia; after parturition, after concussions of sound, and occasionally in perfectly normal individuals. The sounds are seldom of such intensity as in adhesive inflammation. When they accompany sensations of light and disturbances of other nerves they signify a central disease. They may disappear, but frequently continue for life without impairment of hearing. The treatment consists in attention to the general health and concomitant conditions.

In conclusion, let me say that this paper is not intended to be exhaustive, but only suggestive. I was prompted to write it in the hope of eliciting useful suggestions in the treatment of the disappointing class of cases of which the following are types:

Case One.—Was a subacute catarrhal inflammation of each middle ear of some three weeks standing, with a post-nasal catarrh of longer duration and partial closure of the Eustachian tubes. The hearing was scarcely at all affected, although the drum membranes were rather dull, with small light spots, but they vibrated well with Siegle's otoscope. Bone conduction was somewhat diminished on both sides, but markedly so on the left, indicating a probable involvement of the structures of the laby-

rinth. She consulted me in May of last year solely on account of the very annoying tinnitus in the right ear, which dated from a cold the previous winter. I treated her at frequent intervals for three months with but little benefit. The noises were generally lessened and sometimes were entirely absent for several hours, and occasionally for one or two days after treatment, comprising at various times inflation, instillation of solutions through the catheter, massage through the nose and Eustachian tubes and refraction of air in the external meatus, together with local applications to the throat and the indicated remedy. The relief became less pronounced as the treatment was continued, until at the end of five months she became discouraged and ceased attendance. The post-nasal catarrh was better, the tubes were patulous, the hearing still practically normal, and the tinnitus unchanged. What more can I do for this case? Can anyone suggest a better line of treatment or offer me any encouragement for permanent relief? The patient knows of this discussion, and awaits anxiously the outcome of it.

Case Two.—Was a school teacher, who came to me in September, 1900, complaining of slight deafness and tinnitus in the right ear, which had annoyed her for about eight months. The right drum membrane was somewhat thickened and dull, and she had a hypertrophic rhinitis and enlarged right tonsil with tubal catarrh. Catheterization was attended with mucous rales and afforded some relief of the tinnitus, which was still further ameliorated after the use of Siegle's otoscope, which also increased the hearing distance for the watch from six inches to two feet. A positive result with Weber's test and a negative one with Rinne's excluded an affection of the labyrinth. *Hydrastis* was prescribed with a local application of Glycerole of iodine to the throat and adhesions between the tonsils and anterior palatine arches were separated. At the end of a month she ceased treatment, with much improvement of all conditions; hearing not noticeably affected for conversation, and tinnitus only slight and occasional. In a year she returned with a renewal of deafness and tinnitus in the right ear. Then the drum membrane was of nearly normal appearance, but with very slight vibration. The throat was again somewhat inflamed, but the tubes were normally patulous. She was then treated with massage and electricity for two months, at first with no improvement, but finally with a diminution of the tinnitus, but no betterment of the hearing. The improvement of the noises was, however, only temporary, and although she continued faithfully under treatment of various sorts for several months longer, practically nothing was accomplished.

In this case I think there was undoubtedly a sclerosing or proliferous inflammation in the tympanum causing a gradual anchylosis of the stapes, which is beyond my skill to relieve.

Case Three.—I will mention one more case, that of Mr. J., who consulted me first November 4, 1902, complaining of slight deafness in each ear, and an annoying tinnitus confined to the left ear. This was of only

two weeks duration, a sequence of a catarrhal cold. Rhd. w equals 4 in., Lhd. w, ½ in. Examination showed a serous exudation in each tympanum, with slight redness along the manubrium mallei on the left side. Politzer was successful with some improvment of hearing. I gave him *Gelsemium* internally, and directed him to drop a preparation of equal parts of alcohol and glycerine into the ears once daily. He came again on the 9th, and at that time there was no appearance of exudation in the tympana. The membranes were nearly normal in appearance, save that they were a little retracted, but they vibrated freely with the otoscope. The hearing and tinnitus were practically unchanged. The Eustachian tubes were then considerably obstructed, so that neither Politzer or catheterization were successful, but did succeed in passing a vapor containing Iodine, Menthol and Camphor through them with the nebulizer. He complained of a feeling of stuffiness in the ears and of a resonance of his own voice when speaking. I prescribed *Kali mur.*, and instructed him to practice Valsalva.

At his next visit, November 16th, these subjective sensations had entirely disappeared, and he was not conscious of any difficulty of hearing. The test with the watch was about the same, however, and the tinnitus was as annoying as ever. The Eustachian tubes were patulous, but an adhesion had formed between the apex of the left manubrium and the promontory. This I succeeded in breaking up by the use of the Delstanche masseur.

In less than a week the adhesions reformed, but was again and permanently liberated by massage. He was seen for the last time in December. Each membrane was of good lustre, somewhat retracted, but vibrating freely. He was not conscious of any difficulty of hearing, although the test with the watch showed no improvement. The tinnitus which first led him to consult me was still very annoying. *Causticum* was prescribed, and he has not since been seen, so that I am uncertain of the final outcome.

Here undoubtedly the exudation in the tympanic chambers was not completely absorbed, leading to the formation of bands of adhesion, which, contracting, interfered with the mobility of the osicles and increased the intra-labyrinthine pressure.

Similar cases might be multiplied, but they are familiar to you all.

We often learn more from our failures than from our successes, and I hope this imperfect paper may lead to discussion which will result in more satisfactory treatment of tinnitus and the pathological conditions with which it is associated on the part of the writer.

DISCUSSION.

Howard P. Bellows, M. D.—The paper to which we have just listened is a very thoughtful one, and very thorough within the scope which the writer assigns himself. Practical experience with the subject is evi-

dent upon every page, and it is strictly honest. The frank confession of defeat in many cases, some of them even cases which were undertaken at the outset with the expectation of success, finds a responsive echo in the mind of every man among us. As the years pass and new methods of treatment successively follow each other, to be tried and adopted in many instances until some better knowledge comes to us from our own experience or that of others, we are steadily gaining, I believe, in our ability to improve the hearing of our patients. I, myself, enter upon the treatment of deafness in general with much greater confidence that in the past, but can I say the same of treatment of tinnitus aurium? Can we any of us lay claim to a proportionate gain in our ability to relieve this distressing condition. How often my patients say to me: "Doctor, I don't care about the hearing if you will only stop this noise in my head." We forget the many cases in which ordinary tinnitus accompanies moderate deafness and both alike yield to routine treatment. We do not forget those in which deafness is cured, or in which there is no deafness at all, but an incessant subjective noise brings the patient to our office week after week, and month after month, in search of relief. These patients sometimes characterize their condition as "maddening." If any sort of case is maddening to the aurist as well, it is this. Yet we must not yield to pessimism in dealing with these cases, or even in thinking of them. The fact remains that the great majority of these cases are, after all, either cured or greatly relieved. Some cases even admit of brilliant results from treatment, and the thought of these should tide us over the times of despondency, and encourage us to persist in our efforts to improve the intractable cases which are prone to assume undue prominence in our minds in estimating our work as a whole.

I heartily concur with the writer in his statement, that "Undoubtedly the treatment by the homœopathic remedy, combined with inflation and massage skillfully and cautiously used, offers the best hope of success." In the selection of our internal remedy much has to be taken into account, however, besides the local condition. I am becoming more and more convinced that the secret of success in many of these more obscure cases lies in the recognition of reflex influences, perhaps from organs quite remote from that of hearing. These systemic or distant functional causes are often extremely difficult to run down; they require all the skill of the general diagnostician and often that of more than one specialist in addition before the true underlying cause can be made apparent. To this our homœopathic remedy can be applied and a degree of success expected which can never be attained by the prescription based upon local symptoms alone. I more than suspect that the case which the doctor presents for advice may belong to this class. No adequate cause for any reflex influence being discovered by a most careful investigation of the nasal cavities, I would suggest as the next step, if it has not already been done, that a thorough investigation be made of the condition of the liver, kidneys, uterus and other distant organs in

the hope of discovering some organic or functional fault which would bear upon the condition at hand and its treatment.

Two or three points are especially suggested to me in this paper for comment. In connection with the sound like the fluttering of wings, which is due to spasm of the inter-tympanitic muscles, I will mention an interesting case, which I once treated, where the patient complained of somewhat similar sounds but much less rapid, the recurrence of which could be readily counted. I suspected in this case rhythmical, spasmodic contractions of the palatal muscles. Firm pressure upwards and outwards upon the soft palate in the direction of the Eustachian tube caused cessation of the sound as long as the pressure was maintained. Carrying a small, hard rubber catheter into position, fixing its beak in the mouth of the Eustachian tube and releasing its end so that it lay lightly in the nostril, I was pleased to see the outer end of the catheter moving with a rhythm which corresponded exactly with the sounds which were heard, and absolutely demonstrated their cause. Treatment directed to a catarrhal condition of the naso-pharynx and middle ear cured this case.

I would suggest as an explanation of the statement that "deaf mutes who still retain a certain degree of hearing power, seldom have subjective auditory sensations," that the deafness in all such cases develops in the earlier years of life, before the tissues of the conducting portion of the ear have a chance to become rigid, and, if due to labyrinthine disease, as is the case in a great majority of instances, subsequent thickening, even of an intact drumhead, can never produce the effects which would be expected from increased inter-labyrinthine pressure with normal nerve filaments. If, on the other hand, the deafness is due to suppurative destruction, which is sufficient to produce deaf-mutism, the almost total absence of drum-head and ossicles, which this implies, is seldom attended with tinnitus, even when the labyrinth is normal.

In conclusion, I will answer, as well as I can, the request of the writer for information in regard to the effect of the high frequency current upon tinnitus aurium. My personal experience with this current covers a year and a half, and I have applied it in many different ways. I have thus far obtained the most apparent effects upon subjective noises by the use of the bulb-shaped glass vacuum electrode, with a rarification of about one five hundredth of an atmosphere and showing a violet color while the current is passing. This I apply directly back of the ear, over the mastoid, and seldom retained more than one minute in position. The result is in most instances an immediate modification of the subjective noises—quite often their total cessation for a short time—but the full effect is of rather short duration. In favorable cases some improvement lasts after each treatment, and the benefit is cumulative. In other cases no effect upon tinnitus is evident. I have never pushed it far enough to get any aggravaton, but can really believe it possible to do so. On the whole, I cannot speak of my experience in its use thus far, with any enthusiasm so far as the permanent relief of tin-

nitus aurium is concerned, though more than pleased with its effects, in many cases, in improving the hearing.

Herbert D. Schreck: I regret I have nothing to present to Dr. Linnell that will be of service to him in treating this intractable condition or in meeting those cases which he presents in his paper. It is one of the diseases where dubious experience has led me to be very careful in regard to my prognosis. Indeed, I have become almost a therapeutic nihilist in regard to this particular trouble. Where tinnitus is the chief causes for seeking relief and the deafness only incidental my experience is that 80 or 90 per cent. of such cases can have the hearing benefited without effecting the tinnitus. Of all sorts of local applications, etc., that I have tried for this trouble very few have been of any benefit, and the same may be said of my experience with the homœopathic remedies. There is probably no division of the Materia Medica where the symptoms are more unreliable than in tinnitus, where in many works the various kinds of tinnitus are indiscriminately put down as hallucinations of hearing.

There are two difficulties in the way of getting at the exact symptoms, the paucity of the accurately recorded symptoms and the difficulty of patients accurately describing the sounds they hear. It is impossible to know how many of the various symptoms put down in the Materia Medica under the head of tinnitus actually resulted from the drug and how many were due to the conditions previously present in the provers. It is sufficient to know that until we have some pathological basis upon which to base our symptoms instead of depending entirely upon vague subjective conditions that may depend upon any aural disease from those of the canal to those of the brain, we shall be almost helpless in securing benefit from drugs in a field where they ought be of great service. I have yet to meet the case where I have felt that hydobromic acid, salicylate of soda or other seemingly indicated remedies, even when Menier's syndrome was present, have proved of actual benefit. I am continually trying to feel my way in prescribing for tinnitus, together with other aural conditions, but my progress has been anything but satisfactory up to the present time.

It does seem to me that the loss of the upper tone limit is not conclusively reliable for diagnosing disease of the labyrinth. It has been my experience to see very few cases of pure nervous deafness, where it was not possible to demonstrate pathological conditions of the ear that would account for the tinnitus.

My best results have been secured from the pneumo-massage, with occasionally some benefit from Farradism or galvanism. With most of these cases the effect is fleeting, lasting from a few moments to several hours only, and then returning as intensely as before the treatment. A few cases have been cured, a few others modified, but a larger number have not been changed at all.

I have had during the past winter three or four such cases as is reported in the paper upon which I have expended all my ingenuity in

devising all the known methods of treatment without producing any impression upon the tinnitus, but improving the hearing in most of the cases. The passing of bougies has been with me a last resort along with Deuel's eustachian electrodes, but the results have not been satisfactory. The number of cases, however, treated this way has been only five or six, and, of course, the number is too small upon which to base any positive statements. As in many cases where the eustachian tube can be opened by Politzer's method or the catheter show a considerable constriction so only a very fine bougie will pass, it would seem as if benefit might be derived from enlarging the calibre of the tube.

Some benefits have been reported from the use of telephones, but I have not tried them, and if any one is present who has had results from their use it might be a benefit to report them.

C. L. Rumsey, M. D.—My experience with tinnitus aurium is the same as given by our essayist. I have studied the pathology and symptomatology to find no permanent benefit from my remedies, and seldom temporary relief. There is one exception to this experience. I gave *Kali mur.* 3x continuously for six months to a patient whose general and special condition seemed suited to this drug, with a gradual and permanent relief. There comes the query, Would we have better results by long continuance of the drug?

My experience with massaging around the ear, in front of the tragus, along the Eustachian tube and over the mastoid by the Wappler or Gary's instrument has removed for the time tinnitus aurium.

W. R. King, M. D.—It seems to me that the essayist and the discussants have left very little else to say. When the paper spoke of remedial measures, I thought of several remedies that had given me satisfactory results in the past. In several instances I have been much pleased with the results attained by the internal administration of *Pilocarpine muriate* in the 2d decimal. I used it without following any special proving on the experiments of Prof. ——— made many years ago. The results in some of his cases were very good, indeed. The effects showed that it had a specific action upon labyrinthine inflammation. I generally used it in trituration and in the same class of cases described in the paper, except two in which the benefit was derived by injecting a solution of it through the Eustachian tube into the middle ear. On the whole, my experience shows the same lack of success as is spoken of by the discussors who have preceded me.

The statement made by Dr. Bellows is, I think, particularly worthy of attention; namely, that the number that have been relieved either partially or completely, should certainly be an incentive to continue in the study and endeavor to conquer this obstinate class of cases. I have a case of nine years standing, of a most distressing tinnitus; it is in the right ear only. Under routine treatment with inhalations, medications and massage the hearing has improved almost thirty per cent., but the tinnitus has not yielded at all; the character of the tinnitus is like that of hissing steam, and that is the kind that has always proved the most

stubborn in yielding to treatment. If in a given case of tinnitus I can demonstrate by means of a piano note, tuning fork or violin the pitch, the musical pitch of the tinnitus, I then hope for good results by phonetic masage, making the pitch as near as possible the same as that of the tinnitus. I do not know whether this is homœopathic or not, but I do know that in those cases I have the best success.

R. S. Copeland, M. D.—I think that we have all been greatly pleased and benefited by this paper. The absence of tinnitus in deaf mutes, it occurred to me, may be explained by the partial fusion of the bones at the base of the skull, and the consequent imperfect development of the labyrinth and auditory nerve.

One of my assistants has recently used an application of the static current in these cases, and claims that he has relieved some cases. I believe that mechanical means, such as the application of the Wappler machine, to be the most generally satisfactory.

E. H. Linnell, M. D.—I had hoped that when Drs. Bellows and Schenck took the matter under consideration, they would give us something new. I am sorry that they have not more encouragement to offer us. Dr. Bellows's suggestion to look for symptoms remote from the ear would be rather difficult to follow. I find that when patients come to me for ear trouble they are not very willing to enter into the details of their bodily symptoms. In regard to *Kali muriaticum,* I have tried it in a great many cases and only occasionally have I got any satisfactory results. I have been disappointed with it more often than not. But we must remember that in tinnitus aurium we have been disappointed with almost every method that we have tried. I have tried all kinds of mechanical manipulations, massage, vibratory, telephonic, with the organ and the Wappler instrument. I believe that I get the most satisfactory results with the Wappler machine. I have one case that is always relieved by the organ, using as nearly as possible the same pitch as the tinnitus. One treatment gives relief for a long time.

THE LOCALIZATION OF FOREIGN BODIES IN THE EYE BY MEANS OF THE X-RAY.

BY JOHN H. PAYNE, M. D.,

Boston, Mass.

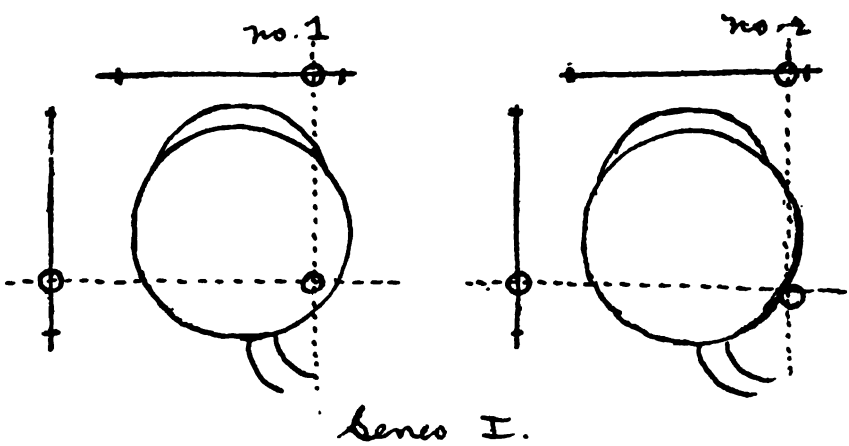
1. X-ray of use in demonstrating presence of small bodies when projected through temporal regions.
2. Methods of examination at present employed.
3. Objections to them.
4. None of them diagnose between a foreign body within and one without the eyeball.
5. Description of a new localizer for this purpose.
6. Demonstration of its working.
7. Relation of a case.
8. The kind of tubes used.

Many devices have been proposed to demonstrate the exact location of foreign bodies within the eyeball by means of the X-ray, but none have proved fully satisfactory under all conditions. Those that have been of the most simple construction and the most easy to manage have been of such a nature as to throw an obscuring shadow over some part of the eye and to thus conceal the location of small bodies; and others have been so complicated in adjustment, and in the mathematical computations required after adjustment and exposure, as to render them unfit for common use. The X-ray in its present degree of development is ordinarily only successful in demonstrating the presence of minute metallic bodies when projected through the head from one parietal region to the other, and not when forced through the occiput to the sinciput, because the cranial bones present far less obstruction to the former than to the latter. It is true that occasionally larger bodies, such as a bullet, can be located by this latter test, but for ordinary purposes of detection of such small bits of steel, as so frequently find ready lodgment within the eyeball, it is unreliable. One other objection also to this method of administration is based on the fact that no clear image of a small body can be procured unless the plate of the negative is brought into comparatively close apposition to the foreign body,—

in other words, that the projection of the shadow of the foreign body on the negative plate, or on the drum of the fluoroscope, is rapidly diminished in clearness in proportion to its distance from either of them. It is evident that the distance of a foreign substance within the eyeball, unless it be very anteriorly located, is necessarily greater from a negative placed against the face than from one placed close to the temporal region. The methods most commonly used in this country are those described by Dr. Charles H. Williams, of Boston, a similar one by Dr. Wm. M. Sweet, of Philadelphia, and another by Dr. Webster Fox, of Philadelphia. You are undoubtedly familiar with these, and therefore I will merely say that, whereas the two former are successful in a large degree in locating an object within the eyeball, they nevertheless present such problems in computation as to preclude universal adoption; and the latter by Dr. Fox has a decided drawback in the shadow thrown across the eye by the intersecting metallic lines of the wire mask that may conceal the object. The recent method used in England and described in the London Lancet of February 28, 1903, No. IX., of Vol. I., series of 1903, by M. S. Mayou, is called the Mackenzie-Davidson method, and is there described as follows: "In recent cases and cases where there is much photophobia a wire stitch was fixed in the conjunctiva directly below the center of the corneal margin, the eye having been first cocainized; but in cases where there was no photophobia a piece of fine wire was fixed over the lower lid and kept in position by the lashes, and the patient was directed to gaze at some object so as to bring the corneal margin in contact with the summit of the loop. The head was fixed in a Mackenzie-Davidson head rest, taking care that the cross wire did not fall across the orbit. I wish to emphasize this point, as it was due to this occurring that the case mentioned above was missed, the shadow of the foreign body, which measured barely a millimeter, falling across the shadow of the wire and being obscured by it." "Two separate photographs are taken, as they are liable to render the images indistinct when taken on the same plate. This is done twice over, as I have seen a foreign body missed in two successive photographs owing to the patient moving his eye, and making the image of the foreign body, which was a very small one, indistinct." This last observation of the writer is a very good one, and should be taken into account always in making a final diagnosis. He goes on to say: "The method of subsequent localization is worked out on a drawing board. It is cheap, efficient and takes practically no more time than other methods. Having found the relation of the foreign body to the

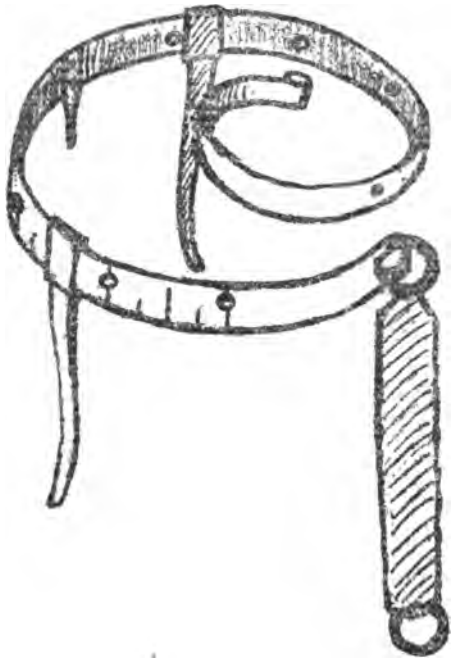
Skiagraphic picture of the finder with its two pointers in accurate position, and the shot in the eye close to end of pointer.

cross wire, and to the wire on the lid, the next thing to do is to mark it on an eye drawn to a scale, such as can be found in Quain's Antatomy, and observe its relation to the various structures of the globe." This description is unintelligible in some of its parts, but the main point to be observed is the fact that this method, as in the Webster Fox wire eye mask, is liable to confusion from shadows thrown by the device across the photographic path of the X-rays, and to thus favor concealment of a small foreign body. You will observe that all of these methods deal with foreign bodies that are undeniably within the eyeball, but take no account of a differential diagnosis between objects just within the coatings of the eye and those just without in the orbital tissue. That great practical difficulties present themselves in this differentiation is evident by the diagrams I have the honor to present to you here.



No. 1, of Series I., you will observe represents a foreign body lodged within the eyeball, and the resultant negatives when the X-rays have been projected through the head and eye from side to side and from back to front. No. 2, of the same series, represents a foreign body that has passed completely through the eye and has lodged in the orbital tissue just outside the sclera. The photographic results you will observe are identical. Now the question arises in such a case, shall we or shall we not enucleate, and our decision must rest largely upon our X-ray examination. Clearly in such a case as the above this would prove misleading. It is for just such cases as these that I have had made the metal finder, simple in construction, small in bulk, inexpen-

sive and easily applied, that I hold before you here. You will perceive that it consists of a narrow band, ¼ inch wide, of tempered steel, curled upon itself, so that when unrolled it may clasp the head around the

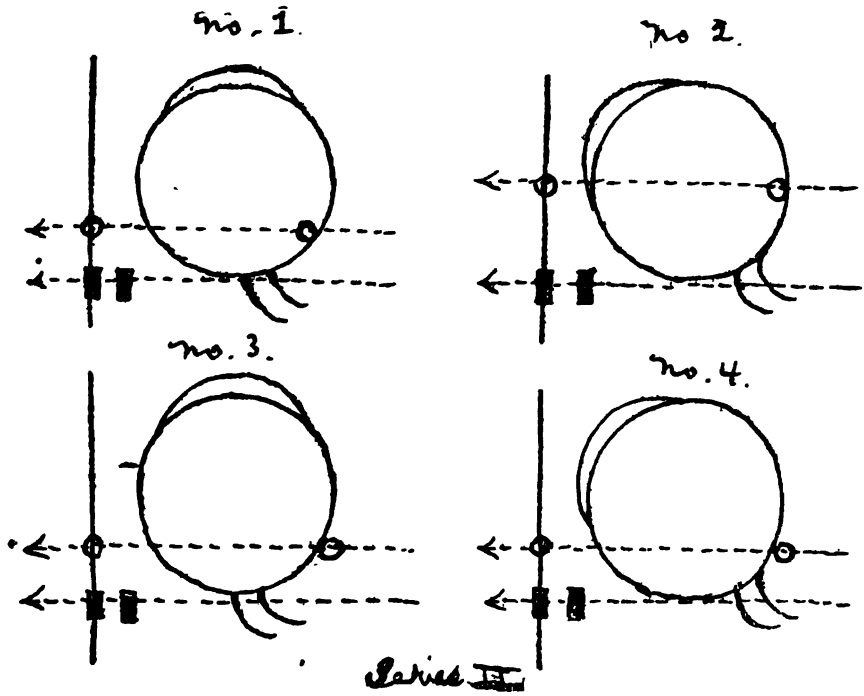


forehead and parietals, and remain securely in place. At the very middle of this I have riveted a small cross-piece of brass to serve as a pointer, and, when in position, to seek its place just above the base of the nose. On each side of the band I have placed a narrow sliding pointer of brass, 1½ inches in length, for adjustment at each temporal region after the band has been secured in position around the head. The band itself has been divided by vertical scratches into inches, and their subdivisions of ¼ and ⅛ inch from each side of the cross-piece above the nose. These pointers are to be pushed along the band until they seek a position well back of the estimated extreme fundus of the eye. Usually 3 inches from the front cross-piece is sufficient. Now this whole apparatus, being of metal, must cast a definite shadow on the negative, and must therefore serve as an efficient aid in locating our foreign body, but care must be exercised that its shadow will fall well without the area of the eyeball so as not to conceal the foreign body within. The object of two pointers, one at each side of the head, is to

assure us that we have sent the X-ray directly through from side to side. This will be evidenced in the negative by their being in such a line that the image of one will obscure the other, and will thus form a single impression. Now as to the practical working of this. It is self-evident that the eyeball, being a movable body rotating on its own axis, must displace the image of a foreign body lodged within it upon the negative plate to the extent of its rotation, hence it is only necessary to take two separate pictures on two separate plates from temporal to temporal region, the first with the eye looking straight forward, and the second with it rotating strongly inward or outward toward the canthus, and to observe on our negatives the relative relation of the pointer and the body in each. It is evident that in the second picture the distance from one to the other must be quite different from that in the first, if the particle is located within the eyeball or on its tunics, whereas if it has found lodgment outside the eye the relative position will remain unchanged. I cannot think of any exception to this rule, except possibly in the event of the object being lodged very close to the optic disc, or to the rotary center of the eyeball, which you remember is placed by Landolt at a distance of 14 mm. from the center of the cornea, and in a direct line with the antero-posterior diameter. Making use then of the foreign body in Nos. 1 and 2 diagrams of Series I. in a set that I will designate Series II., that differs only in the addition of the band and pointers, we have results as follows:

In each of these the dark rectangular bodies represent the pointer and its image on the negative. No. 1 demonstrates a metallic body within the eyeball, and its photographic relation to the pointer when the eye is looking straight forward, and No. 2 the same body and its impression when the eye is rotated strongly toward the canthus. You will note here the increased distance between the objects on the second as compared with the first. Nos. 3 and 4 represent the shadow thrown by a body that is lodged outside the eye tunics and its relation to the pointer when the eye is in the primary and again in the secondary position. You will observe that their relation is unchanged. I have had occasion to test this device in one case only, the photographs of which I present to you here. The offending substance was a bird shot that had passed through the cornea into or through the eyeball, an accident that was followed by loss of vision, inflammatory reaction, and considerable obstinate pain. An X-ray was taken through the temporal regions, and another from occiput to sinciput, without the use of the

band and pointers, and, although the substance was clearly outlined in the first, it was too indefinite in the second to be of much value, so we had to content ourselves as best we could with the knowledge that



we had demonstrated its presence there somewhere in the path of the rays, though we could not definitely say where. However, the pain and the inflammation continuing, the question arose later as to the advisability of enucleation, a thing that the patient was not inclined to submit to unless the substance could be demonstrated within the eyeball, hence this apparatus that I present to you today and the photographs.

Several similar negatives were taken, but with the same result of unchanged relation between the shot and the pointer, and this, together with the fact that the pain and inflammation had subsided meanwhile, decided the patient not to have the operation performed, and thus was lost a beautiful opportunity to establish a proof positive of the correctness of our reasoning. I will say that the tubes used for the temporal photographs were of medium vacuum, at a distance of 21 inches from the negative, and the exposures of four minutes each. That used for the antero-posterior impression was of high vacuum and of shorter exposure.

Addendum:—Since writing the above I have experimented on a case by stitching a small coil of silver wire just over the tendinous attachment of the external rectus, and have taken two pictures, first, with the eye straight forward, and, second, with the eye turned strongly inward, and have found by comparison of the negatives that the foreign body in the second was much farther removed from the pointer than in the first. This change of position could only be accounted for by the rotation of the eye and by the fact that the foreign body was actually attached to the eyeball. Should the foreign body be located just behind the cornea it would seem to be better to rotate the eye strongly upward, instead of to one side, and to observe its changed relation to the pointer in this connection. It occurs to me that it might be well to drill holes in the pointer at intervals of one-quarter inch and of perhaps one to two mm. in diameter in order to allow of rapid computation of relative distances on the photographic plate.

DISCUSSION.

Dr. Loring: I did not expect to be called on and am scarcely prepared to discuss the paper on a single hearing. The doctor has brought out very clearly the faults of the ordinary method, and it is perfectly plain that his method is a great improvement; in fact, it is the only one that demonstrates beyond doubt the presence of a foreign body in the eye, because it moves with the eye, and thus prevents its concealment within the chambers. One great trouble in taking these photographs of the eye, as I can bear witness, is the time of exposure. The No. 3 plate is made for a distance of twenty-seven inches and takes a little over one minute. The one that Dr. Payne has shown you was taken at a shorter distance, and was given four minutes' exposure. This increases four times the chances of the person moving the eye and blurring the negative.

As far as danger to the eye goes from exposure to the X-ray, there is so great a difference between this use of the ray and the therapeutic use of it, that it is not likely to cut any figure. We could make the exposure sixteen or twenty times greater before we would equal the therapeutic exposure to the ray, so it is not dangerous at all. The tissues of the eye are no more sensitive to the X-rays than any other tissue of the body. I shall be glad to answer any questions that I can.

SYPHILITIC AFFECTIONS OF THE NOSE AND THROAT.

BY IRVING TOWNSEND, M. D.,

New York.

THE syphilitic manifestations most frequently observed in the nose and throat are the late forms of congenital and also the secondary and tertiary forms of the acquired disease. For practical purposes we may classify them as follows:

1. The primary lesion or chancre.
2. Erythema of the fauces.
3. The mucous patch.
4. The superficial ulcer.
5. Gummatous deposits.
6. Deep syphilitic ulceration.
7. Necrosis of cartilage and bone.
8. Cicatricial deformities.

Although the primary lesion is not of frequent occurrence in this location, it is by no means exceptionally rare. This possibility should always be borne in mind when a suspicious sore is found on the lips, tongue, tonsils or faucial pillars.

An ulcer of recent origin, having an inflamed, swollen and indurated base, and in addition a chain of enlarged lymphatic glands leading from the angle of the jaw, with or without a history of infection, justifies the provisional diagnosis of chancre.

While the usual method of infection is supposed to be due to the practice of a class of sexual perverts,there are many well authenticated cases in which the disease has been transmitted through the medium of a child from a syphilitic wet nurse to the mother, and vice versa; or cases which have resulted from the use of drinking cups, pipes, etc., and from the act of kissing.

The structure of an hypertrophied tonsil would appear to offer a favorable soil for infection, as nearly three-fourth of the cases of primary sores reported have been located in the tonsil.

The secondary stage is from six weeks to two years after the primary infection. The secondary lesions are erythema of the fauces,

mucous patches and superficial ulcers, the characteristics of which will be referred to later. The subjective symptoms are not well marked, and may be those of slight irritation up to those of an ordinary sore throat, viz.: Pain on swallowing, more or less severe.

The objective appearance and symmetry of the manifestations (erythema and mucous patches) are quite diagnostic, as indicated by Jonathan Hutchinson.

The *tertiary* lesions appear after two years, and consist of gummatous deposits, deep ulcerations, necrosis and cicatrices. Mucous patches may appear in the secondary and tertiary stages, either in the simple form or by irritation or streptococcus infection and becomes superficial ulcers. True ulcerations appear in this stage, the loss of tissue being rapid and extensive. This lesion is always the result of the breaking down of a gummatous deposit, and in the earlier stages is usually confined to the fauces, though later on the post-pharyngeal wall, the tongue, the larynx, or nasal structures may be the seat.

Bosworth asserts that the necrotic process does not extend beyond the site of the original gummy deposit, and that there is no new and progressive deposit of gummatous material beyond the site of the original ulcer. This statement may be interpreted as meaning that only the tissues included in the gummy tumor are destroyed, and that the ulceration stops when the borders of the original swelling are reached. This is contrary to the general belief and inconsistent with the fact that very extensive ulceration sometimes develops where the tumefaction preceding had been quite insignificant. Cicatrices and adhesions resulting from this form of ulceration are persistent during life, except as they are modified by surgical means. The distressing deformity resulting from necrosis of the bones of the nasal septum is familiar to all and is the most conspicuous mark borne by the victim of neglect. The lesions characteristic of the tertiary stage of the acquired disease are identical with those of congenital syphilis, which are referred to later in detail.

When endeavoring to ascertain the existence of a previous syphilitic infection, the result of which may explain the present condition, the following points are to be determined:

Is there a history of a sore (genital or extragenital) followed by skin rashes (without itching), sore throat or alopecia?

In women, have there been frequent abortions or miscarriages?

In children, is there a history of skin eruptions within three months of birth?

Examine mouth, throat and nose for lesions, such as destruction of

the nasal septum and flattening of the nose, perforation of hard or soft palates, ulcers, mucous patches, gummatous swellings and cicatrices.

Examine skin for scars, the genitals for the primary scar, and for syphilitic atrophy or enlargement of the testicles.

Examine the bones (tibia, clavicle and cranial bones) for nodes or necrosis.

Examine the teeth (for Hutchinson's sign), the eyes for iritic adhesions or corneal opacities.

Examine lymph glands for general enlargement and induration.

In differentiating between the local lesions of syphilis and conditions resembling them, the following points are of practical value:

The erythematous eruptions and mucous patches which appear in the early part of the second stage may be mistaken for stomatitis (catarrhal or ulcerative), but in syphilis the rash is coincident with a similar affection of the skin. It has a mottled appearance and is most apparent on the soft palate and faucial pillars. The dull red color is in patches and sharply defined. The mucous patch is usually a simple erosion of the epithelial layer of the mucous membrane, appearing most frequently on the ends of the tongue, the lips, the anterior faucial pillar, though almost any part of the oro-pharynx may be affected. Ulcerative stomatitis affects preferably the gums and inside of the cheeks, and is accompanied by foul breath, a furred tongue and other evidences of gastric derangement. The ulceration resulting from syphilis, carcinoma and tuberculosis are to be differentiated by the following characteristics:

The syphilitic ulcer has sharply defined margins, extends deeply, has an inflamed areola, is covered by a yellowish white necrotic slough, spreads rapidly and attacks underlying cartilage and bone, producing necrosis. Destruction of tissue is rapid and deep. Usually located in the pharynx, pain not great, general health of patient good. Temperature normal. Permanent cicatrices remain after ulcer has healed.

The tubercular ulcer is superficial, covered with a thick muco-purulent discharge, extends superficially, borders not well defined, attacks larynx most frequently. Begins as a small spot of induration which subsequently becomes œdematous; surrounding mucosa pale in color. Patient usually shows physical signs of pulmonary disease, fever, bacilli in sputum, no cicatrization.

Carcinoma begins as a hard tumor which in the course of two to six months begins to ulcerate; ulcer covered with thin sanious discharge; extends in all directions and attacks all tissues. Pain constant, lancinating and frequently extends to the ear; dysphagia marked. No necrosis.

Temperature normal. Cachexia appears later in the disease, and is steadily progressive. Severe hæmorrhage not infrequent and sometimes fatal.

Treatment Constitutional.—If there is any such thing in medicine as a specific or drug whose action is antagonistic or antidotal to the poison of a certain disease, Mercury and the Iodide of potassium bear this relation to syphilis.

With this belief fully fixed, it is our practice to begin the administration of *Mercury,* preferably the Protoiodide, in doses of $^1/_{10}$ grain t. i. d., rapidly increasing the dose if well borne to ¼ and ½ grain t. i. d. This is continued for six weeks or longer (unless gastro-intestinal disturbances compel its earlier discontinuance), when for a period of one or two weeks *Nux vomica* or *Strychnia,* or a similar remedy, is given together with saline aperient waters, such as Carlsbad. This programme is repeated with similar intervals for the first year, unless the drug produces unpleasant derangement of the digestive functions, in which case daily inunctions are substituted, either occasionally or together.

The ointment used—Unguenti. hydrarg. oxid. flav., 1 part; Lanolin, 3 parts—is well rubbed into the skin over the cervical and axillary regions, the groins, abdomen and back, one place each day, so that the application will not be repeated in the same spot oftener than once a week. In young children and persons with delicate skins the proportion of Lanolin should be increased.

At the end of one year *Potassium Iodide* is administered, beginning with 5 grains, t. i. d., and increasing dose 1 grain daily to limit of toleration. During alternate periods of six weeks during the next six months the *Mercury* is administered with the *Iodide of potassium,* but not in combination, as the proportions are constantly changed in order to avoid unpleasant drug effects. There are many methods of administering these drugs, and there may be *better* methods than the one outlined, but this has proven most satisfactory in our hands.

Local Treatment.—Our local treatment of syphilitic lesions (mucous patches, superficial and deep ulcerations) is cleansing by Hydrogen dioxide, or an alkaline wash, and the application of Nitrate of silver, either in a two dram solution, or fused on an aluminum probe, or the stick. We have tried other chemical caustics, and electricity, as recommended by Bosworth, but find none superior to the Nitrate of silver.

The teeth should be brushed carefully two or three times a day, and any cavities or carious spots should be filled. A plain diet and ab-

stinence from alcohol and tobacco during the active manifestations of the disease are essential.

The curability of syphilis is a subject upon which syphilographers disagree, and volumes have been written pro and con, but this much is proven: Syphilis yields readily to appropriate treatment, and as far as our own limited experience and observation goes there seems to be few relapses in cases treated for a period of two or three years. We all know of cases which have been treated five, ten, fifteen or twenty years ago, which have been cured to all practical purposes; that is, they have had no recurrence of lesions, and have married and have become the parents of healthy offspring. If this is not a cure it is certainly a pretty good substitute for one.

DISCUSSION.

W. Casper Cook, M. D.—When I was requested by our president to discuss a paper on syphilitic affections of the nose and throat by Dr. Irving Townsend, I at once looked up the literature on the subject, also the Transactions of this Society. I find that Dr. Townsend has been a prolific writer, having a number of execllent papers to his credit; so when his paper reached me I was prepared to acknowledge its completeness.

It seems he has included everything practical, as there are so many symptoms given in text-books that I have never found in patients. I find, however, one important symptom he did not touch upon that gives me considerable trouble, *i. e.*, the mental symptom afflicting the male. He cannot be convinced that he is improving, and when he is practically well he still feels he can or will never be cured. If any of his offspring get sick he will morbidly attribute every symptom to his former ailment.

I have endeavored in several ways to lecture to such individuals according to their temperaments, but cannot say I have been successful in many cases.

I believe these cases can be cured if they will continue treatment, for from five (5) to ten (10) years, both local and systemic. It is not what the patient does but what he should not do that will aid him the most.

C. H. Hubbard, M. D.—Whenever Dr. Townsend speaks he always says something, and this lucid and logical paper is in accordance with his usual custom. In regard to the treatment, we do not at the present time look upon syphilis as a thing simply to be dreaded, for we have learned that it is a disease eminently responsive to medication. Cases that at one time we feared we now approach with great confidence. I regard the presence of the so-called Hutchinson's teeth as of little weight in diagnosis unless confirmed by other signs or by the family history. We may find those teeth in individuals with no syphilitic trouble, and on the other

hand we may find perfect teeth in those who are surely affected with syphilis. Then, again, the diagnosis of syphilis based upon the perforation of the septum is fallacious. At one time I put down every case of perforation of the septum as syphilitic, but I have lived to know better than that, as it not unfrequently means tuberculosis. Mercury and Iodide of potassium are the classical remedies for this trouble, and we all recognize that we get good results from them. I do not think that the heroic doses that are frequently given are always necessary, and, indeed, such over-dosage is frequently productive of much mischief.

A very capable physician and surgeon sent me a patient with iritis with considerable adhesions which he had been treating unsuccessfully with what is called mixed treatment. I stopped the medicine and gave Cyanide of mercury in very small doses, at the same time using Scopolamine, which successfully broke up the synechiæ.

She then went back to her regular physician, who again put her on large doses of the mixed treatment. In six weeks she came back with iritis again. I stopped the treatment once more, and she made a good recovery. When the patient came back the second time there was present also pharyngitis and laryngitis, all of which went on to a successful issue, on little or no medicine at all.

My preference is for the Binoidide rather than the Protoiodide. During the exhibition of the Iodides I always instruct my patients not to be afraid of water as a beverage. Essence of pepsine I have found to be a good vehicle for the Iodide of potassium. As to local applications, I seldom use the Nitrate of silver. I get better results from Iodine and Glycerine. It is more satisfactory in its effects and acts more promptly. Nitrate of silver sometimes causes the sore to spread. There are many other remedies besides Mercury and Iodide of potassium that are used in syphilis with success, and we should not forget this and blindly adhere to the standard treatment to the exclusion of other important and curative remedies.

J. B. Gregg Custis, M. D.—I do not know exactly what you are talking about, but if I understand the question it is whether homœopathic treatment is capable of curing syphilis. For my own part I believe that it is the best treatment that I know of at the present time for the disease. I remember one patient who was affected with the disease, which had advanced to perforation of the palate, with all of the other symptoms that are common to syphilitics. He had had full doses of Iodide of potash and of Mercury. In the treatment of his case my first effort was to antidote the drugging to which he had been subjected; after that I prescribed entirely upon the indications, and result was entirely satisfactory, the throat was healed, the perforation covered and the patient made happy.

The next question which confronted me was whether he was incurable. Inasmuch as he had increased in weight and was in excellent condition, I , without hesitation, decided that he was not. During the first part of my treatment of this case I directed my attention to antidoting the

mercurial symptoms that he presented, always deciding upon the remedy by the symptoms present. *Aurum* and *Kali bichromicum,* both in potenciess, were mainly used. *Mercury* is an excellent remedy for syphilis and is frequently indicated, but it is not necessary to give it in material doses. *Kali bichromicum* is frequently indicated when the disease affects the mouth and nasal cavities. *Corallium rubrum* is frequently called for when the syphilitic spots have a red areola about them, no matter whether the disease shows itself in the throat, on the glands, or on the body.

I am glad to give my testimony in favor of homœopathic treatment of syphilis, and know from experience that there is no necessity for the grain doses so frequently prescribed.

I did not mention, as I might have done, *Nux moschata.* Great sleepiness on the part of the patient always brings that drug to my mind. (The patient always complains of dry mouth, dry tongue and tendency to faint. *Nux moschtat* patients want water by them all night so that they can wet the parched mouth.

E. B. Nash, M. D.—I feel a little diffident in speaking before a body of specialists, but I have practiced for forty years in general practice, and during that time I have had a fair share of the class of cases under discussion, and I have treated them from the start and also after they have had a long but unsuccessful course of Iodide of potassium and of Mercury, and in both cases they got well promptly and permanently under the homœopathic remedy. The remedy is not by any means always *Mercury.* I have had cases in which the chief agent in effecting a cure was *Kali bichromicum.* I have cured two cases with *Stillingia* in a high potency. I have never in my life seen a case of syphilis which did not promptly respond to the remedy indicated by the symptoms.

G. P. Waring, M. D.—I have treated syphilitic cases only with the potentized remedy; some have responded readily, some not so well. The trouble is to find the right remedy. There is plenty of evidence that the potentized remedy will act if it can be found.

One caes in point I treated and it astonished me very much. If I had not witnessed the cure I would not have believed it.

A woman about thirty-five years old had suffered for three years with a rapidly progressing affection of the nasal cavities. She was syphilitic. The palate was perforated, and the ulceration of the throat and nasal pasages was very pronounced.

I saw her first after several operations had been performed with the hope of relieving her, but without success. The specialists had done what they could for her.

It seemed to me that she was in a very critical condition, but fortunately the symptoms were very characteristic, so that there was no doubt what her remedy was, if she was within the reach of remedies at all. She was cold all over all the time, severe pains in the head, worse at night, worse on one side, better from warmth, bowels so constipated that no natural passage had occurred for several months. Finally, enemas

refused to act, and so did large doses of powerful cathartics. The patient was going on rapidly to death.

The remedy was *Silicea,* undoubtedly, and I gave it in the one thousandth potency, one dose only. It was followed by prompt amelioration. There was more sleep, more rest, and less chilliness, and best and most astonishing of all, a natural movement of the bowels the next morning.

I would not have believed such a result possible so soon if I had not observed the case. The peculiar progress of the case demonstrated that it was the action of the homœopathic remedy and nothing else. The pains that were so severe in the head, left that region and appeared in the arm. Pains then appeared in the hips, and in ten days disappeared entirely, leaving through the feet and toes, going from above downward, the direction of a homœopathic cure.

No other medicine was given. I saw her four years later and there was no return of the trouble.

Geo. B. Rice, M. D.—I have had some experience with Burnham's Soluble Iodine, and have been favorably impressed with it. I have substituted in some cases the Iodide of strontium for the Iodide of potassium with good results. The dose is about the same and the irritation is less upon the whole system, and especially upon the stomach. The Strontium salt also seems to have less irritating effect upon the skin. Some months ago I came across this preparation of Burnham's. It is very strong, one drop is supposed to contain the equivalent of fifteen grains of the Iodide of potassium. It is pleasant to take and seems to be quite as efficacious as any other form of Iodine that I have tried.

R. S. Copeland, M. D.—I should like to inquire of the essayist whether he has observed any syphilitic affections of the tongue, and been able to make out a decided diagnosis from cancerous affections?

Irving Townsend, M. D.—If I had a doubtful case of that kind, one in which the characteristic points of differentiation were not present, I should administer Potassium iodide in order to clear up the diagnosis. Syphilitic affections of the tongue yield very easily to Mercury and Potassium iodide. In regard to Dr. Hubbard's remarks about perforation of the septum, I quite agree with him that that lesion is by no means always of syphilitic origin. Indeed, quite a fair proportion of perforations of the septum are due to other causes. Many times a simple ulceration will develop from an erosion, on one side of the septum, and break down the underlying cartilage. I am glad to hear of Dr. Rice's experience with the soluble iodide. I know that the Iodide of potassium is open to certain objections, and if this preparation will answer the same purpose, without the objection, it is a valuable acquisition. In regard to the use of the homœopathic remedies, I have employed them intercurrently; but when it comes to syphilis, I believe that we have here to deal with a specific poison, and that Mercury and Potassium are in the nature of direct antidotes to that poison, and, therefore, necessary.

SYPHILITIC AFFECTIONS OF THE EYE.

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THERE is no part of the organ of sight that is not capable of showing to a greater or less degree the manifestations of syphilis. Cases which are obscure and in which the cause is not easily discoverable, have come to be considered by clinicians as of syphilitic origin. That this is true is proven almost daily in text-books, in current literature and in clinical lectures by the fact that the so-called specific treatment is prescribed on the supposition that a diagnosis will be cleared up, if not substantiated, and one of the points that I shall hope to bring out in the paper for discussion is this very question—as to whether we have a right to say that if a case improves after the administration of the so-called specific treatment, that the case was syphilitic. A second point which I have frequently asked myself and other physicians, which I will bring up for discussion, and which I hope you will answer definitely, is: Whether there is any possibility of the later manifestations of secondary or tertiary syphilis and particularly as it affects the eyes in those cases which deny the original infection, but which do admit an initial attack of gonorrhœa, with possible recurrences. "Syphilis is not and cannot be excluded as a cause of certain diseases under question, even when neither the history nor the somatic signs are attainable." The evidences are so often commingled with those of alcoholism, senile changes, arterial disease, as well as those of the kidney and the heart, that it is well-nigh imposible to distinguish between them.

We are told by most authorities, and I believe it is generally conceded, that true specific symptoms cannot follow other infections than those of a hard chancre, and yet authorities are changing their opinions, and Fournier has changed his views from this extreme to advocating as his belief that soft chancre or suppurating buboes are frequently followed by constitutional syphilis. (Jour. Am. Med. Assn.)

When we come to deal with syphilitic affections of the eye, we not only have to deal with this organ itself, but generally with the whole constitutional disease as a cause, and particularly that of the brain and nervous system.

Another interesting question is how soon after the initial infection is it possible to have distinctly specific inflammations of any individual organ, and which organs are most quickly affected?

In my researches I have discovered good authority for the statement that eye symptoms, and particularly those of the iris, may occur within a few weeks after infection and sometimes it is the first and earliest symptom.

The same thing is true of brain syphilis. Patrick says that brain syphilis is the most frequent in the first year after infection, whereas others say that their experience teaches them that the lapse of time from six months to two or three years is necessaary for the development of distant local inflammations. On the other hand, there is likewise authority to show that the disease may lie dormant for twenty or thirty years after the original affection before the consequences were visible, and a clinical case is cited showing the rapid results of the mixed treatment at the end of that time. (Langdon.)

As affecting the eyes, the disease takes on the following forms: In its earlier and immediate manifestations, particularly of the iris, the inflammation is often gummatous and is a vascular inflammation, just as in the later stages it is still a vascular inflammation, but the ocular signs are often due not so much to the specific infection as they are to the arteritis set up as the result of the infection, as shown notably in the diseases of the choroid and retina. In other words, the nervous tissue is never the primary seat of the inflammatory process, but basilar meningitis, one of the most frequent cerebral lesions resulting from syphilitic affections, is very often the cause of the ocular symptoms, so that we have no right to treat a case of syphilitic eye disease as a purely local manifestation.

As I remarked in the beginning, there is no tissue of the eyeball or orbit that is free from possible inflammation, and, although it is not necessary to go into the various diseases as they affect the different histological membranes, yet the citation of a few of the forms may not be amiss, with the addition of some accompanying clinical cases.

Chancre of the lid is rare and yet seen sufficiently often for us to keep it in mind as a possibility, and there are plenty of cases on record in current literature; some of you may even have seen them, though I personally do not know that I have. Even the active inflammations as involving the retina and the optic nerve are not always visible at the time of most active inflammation, but generally are seen when the results are apparent. This is evidenced by the cases reported at the meeting a year ago by Dr. Stewart, and in the discussion which followed,

but few cases having been recently seen by the members present, and at that stage of the disease, it is probably true, as Dr. Stewart remarked, that the treatment does not alter the changes produced by syphilitic retinitis; so we must be on our guard when we speak of syphilis not being amenable to treatment, or the reverse, for, although we are skeptical as to the medicine, it seems to me that the point lies here, that the treatment is often and generally capable of accomplishing wonders in the active stage, but that medicine cannot produce restoration of tissue destroyed by the disease.

Keratitis in all its forms, interstitial, punctate, congenital, etc., is one of the most annoying of the features of inherited syphilis. We find it even in babies, but particularly between the ages of six and twelve. It seems as though females were oftenest attacked, but neither sex is free, and no age is exempt. Sometimes this is the sole symptom, and many times connected with deafness, affections of the joints and glands, associated with purulent rhinitis, ulceration of the nasal bones, etc. The diagnosis is not uncertain.

Syphilitic iritis has been so often discussed, and has probably been written about by each of you before me, that we need not take up the subject extensively. We all know that it may assume any and all possible forms of iritis, and that the plastic form is most common, with the frequent occurrence of occlusion or exclusion of the pupil. It generally appears during the early stage of secondary syphilis, is often associated with skin eruptions and frequently appears before them, occurring usually within six months after infection and frequently within as many weeks. It is often the cause of our first suspicions of the general infection. The fact that statistics vary in putting the cause of iritis as specific in from 50 to 75 per cent., is probably not a difference of opinion, but a difference in theory as to the cause, course and development of the general disease, for some observers say that iritis is not specific unless there are gumma present; but the reverse cannot be proven, that if there are no gumma present it is not syphilitic iritis. Even if the fact can be denied from a theoretical standpoint, the evident consensus of opinion is that in a case of iritis (and this generally includes the other tissues of the eye and frequently other organs of the body) in which a diagosis is not proven, but syphilis is suspected, if improvement follows mixed treatment as recommended by the dominant school and as practiced by most physicians the intelligent world over, or even the anti-syphilitic treatment as practiced by strict homœopathists, the syphilitic diagnosis is proven.

Mr. K. came to me something over a year ago with an iritis of three weeks' duration, which seemed to be suspicious in character. After two or three days' watching and treatment by Atropine, and the positive assertion that it was due to syphilis and no other cause, he admitted his infection about six weeks before, and six weeks of Potash and Mercury, together with variously prescribed homœopathic remedies in the hands of his general physician, entirely cured the case. The history, diagnosis, prognosis and treatment were all according to rule, and the case can be duplicated in your own practice almost every week, the prognosis depending more upon the amount of synechia present before the patient was seen than upon the actual cause. We have all had innumerable cases, likewise, in which the cause was so apparent, the infection absolutely denied, with a mixed and anti-syphilitic treatment thoroughly followed up and results not obtained, and the question has always come up to our minds, Was this a case of syphilis or rheumatic iritis? Those who wished to reply in the affirmative have done so without question. Those who have fought this opinion have had it doubted by the others and will probably continue to doubt.

After casting about for a good while to satisfy myself as to the possibility of tertiary symptoms being present, when the patient honestly denied a primary infection, but admitted a gonorrhœa; this seems to me the explanation. During some of these attacks of so-called gonorrhœa there must have been a small and hidden chancre of the urethra, which, mild enough to escape notice as such, is the original seat of entry of the syphilitic virus.

According to Kneis, "Gonorrhœa may also be the cause of metastatic diseases of the eye, especially of the different forms of iritis, which are clinically similar to rheumatic iritis, and these forms generally recur with relapses of the gonorrhœal symptoms alternating with inflammation of the joints.

"In syphilitic retinitis which, as a rule, is the result of specific arteritis and may be present anywhere within a few months after infection to three or four years, there is a central scotoma, and, according to Juler, 'it is a fact of great interest that if the maculæ is punched out the vision is reduced to $^{6}/_{60}$ and Jaeger 16, and so true is it that I suspect central scotoma if the vision is reduced to that degree.' "

One of the other most common forms of syphilitic affections of the eye which we meet with and one which frequently brings the patient to us earlier than the more serious forms is that affecting the extrinsic muscles.

Mr. D. came to me ten or twelve years ago, complaining of diplopia, from which he had suffered for several months, but for which he had not been treated. He had learned to shut one eye or turn his head so far to one side that he could rule out the diplopia, as many of those cases do. Treatment, both specific and otherwise, was followed until it was proven of no avail, and an operation of tenotomy and advancement with resection of the muscle became necessary, and with this operation the diagonsis of an absolutely useless muscular apparatus was proven, but the results of medical treatment were nothing. The history was slightly obscure, although gonorrhœa was admitted, and the man was a consumer of innumerable cigars and a drinker of a good deal of whiskey, a complication which often modifies our diagnosis and may tend to obscure the original cause.

We all have cases in which the paralysis is present in one or both eyes, complete or partial, with all the manifestations of diplopia, which respond so quickly to anti-syphilitic treatment that we are liable to be puffed up, and particularly when these cases of paralysis are isolated and appear as the first symptom, as they frequently do. Every muscle is occasionally paralyzed, but three-fourths of all cases with specific origin are those affecting the motor oculi nerves, and given a typical case of paralysis of the third nerve, with the eyes diverging and the pupils dilated, and, although it is not good medicine not to ask the questions, I believe that most physicians would prescribe anti-syphilitic treatment with the expectation of good results. As a rule, the cases not amenable to treatment are those that appear later in the disease, and in this case they are due not so much to the active form of syphilis as to the results produced upon the nerve tissues of the brain resulting in degenerative inflammation, and, therefore, are beyond the reach of anti-syphilitic remedies, or any remedies for that matter, and do not show the inability of the physican so much as the ignorance and the delay of the patient in what has been proven to be a serious calamity. Some of these paralyses recur from time to time, and many of us have been led to believe that they were forerunners of cerebral or spinal affections, and foretold tabes or multiple sclerosis, which often seems true from a clinical picture.

Kneis says that tabetic atrophy should not be included among the syphilitic diseases, even though it develops in an individual who was formerly syphilitic. This coincides very nicely to the explanation of Patrick, who says that in addition to the fact that 90 per cent. of all ocular paralyses are due to syphilis, and that the explanation may be

that of gummatous deposit, etc., that the real symptoms of cerebral syphilis and consequently ocular syphilis, and particularly those of the later stage, are due to injury of the nerve cells and fibres caused by the external inflammation, arteritis, etc., and the subsequent involvement of the nerves is a secondary consideration; so, that although syphilis is the cause indirectly, the nerve involvement is the real cause preceding the eye manifestations. For instance, Mr. C. came to me a dozen years ago with paralysis of the ciliary muscle and of the circular fibres of the iris. Diplopia was easily produced, and a few days developed a paralysis of the third nerve. No other symptoms were present and syphilis was not admitted, but sufficient excuse was furnished after due consideration and elaborate consultation to warrant us in believing that recurrent gonorrhœa some fifteen or twenty years previously played an important part. Consequently Potash and Mercury, in various forms and dose, were given, followed by persistent improvement, but the case went on steadily and has developed symptoms of tabes or spinal sclerosis, and is now at an apparent standstill, and the explanation which now appears to be rational is the one brought out in the present discussion, that he probably had syphilitic infection without other symptoms previous to the tertiary stage, and I have sufficient proof in my reading that this is possible; that the first of the tertiary symptoms to present themselves were those of the ocular paralysis, which was only a sign of the real vascular meningeal disease produced after a long lapse of time by the slow degeneration following specific arteritis, and in this case, as in the one cited above, anti-syphilitic treatment availed, even after many years in which the disease lay dormant.

Syphilitic inflammation of the choroid, retina and optic nerve are far more serious in their consequences, as they are often accompanied by a detachment of the retina and generally followed by true optic atrophy. These cases are frequently seen and demand nothing in the way of description, but only interest us when we come to speak of the question of prognosis and treatment. This subject was so thoroughly discussed last year by Dr. Stewart and the members present that further reference need not be made except in a general way. So likewis may we have inflammations of the sclera and episclera and every conceivable variation as to the appearance, macroscopical and microscopical, and with all forms of the various diseases running into each other, so we may have affections of the lids, of the various tissues of the orbit, periostitis, caries and necrosis, with involvement of any and all portions of the lachrymal organs, resulting in ectropion and entropion, with and without

destruction of the lids, and the point which is most worthy of discussion seems to me the one of treatment following that of diagnosis, and what we mean by mixed treatment and specific treatment. Langdon refers to treatment by the mercurials and the iodides as a "fragile ideal," and in the discussion which follows brings out the theory that they do not destroy the syphilitic virus, but by stimulating excretion through the bowels, kidneys and skin, they are of great help in eliminating a considerable portion of the toxin proper; that they stimulate the hæmapoietic system at the same time, producing a degree of leukocystosis which may be useful in combating the disease. Now, whether Mercury and Potash are specific to the disease or not does not alter the fact that they are useful in curing it and preventing the develpoment of results, as all that are cured up to the present time testify, and if the local and early symptoms of syphilis are cured or stayed by the administration of so-called specific or mixed treatment and have no power to prevent the consequences of the inflammatory stages, I believe that here is the place where our homœopathic remedies have their use, and the explanation seems to me pertinent, that the symptoms caused by the specific infection or those caused by the medicinal treatment may be relieved by the application of the suitable remedy which may be homœopathic to the case, and this is my explanation of the wonderful cures reported in our literature and gives me a firmer belief than I had formerly that they are of use, for if by their application in individual cases we can remove what appears to be tumors, paralytic conditions and ulcers and prevent degeneration as caused by the various inflammatory conditions, and help restore organs to their function, why cannot the homœopathic remedy step in at the stage indicated when the disease or the mercurials have served their physiological function, and complete the cure by preventing the otherwise inevitable result?

DISCUSSION.

W. A. Phillips, M. D.—A more commendable end to be attained could not be set before us than to demonstrate a satisfactory line of homœopathic treatment for syphilitic affections of the eye. But we are all fully aware that in attempting to prove that any particular line of treatment is superior to every other is an exceedingly difficult proposition to handle. This is true of the disease in all of its stages and in all degrees of severity. The record made by Homœopathy in the cure of other diseases has inspired a hope that attenuated medicines might also in this disease establish a place in therapeutics worthy of all effort. Whatever the possibilities may be in this direction, it is clear that up to date the difficulty of securing statistics from systematically conducted study has

not enabled us to present a satisfactory report. By way of treatment, the physiological action of drugs in this disease appears to be in the ascendency greatly to the exclusion of the so-called dynamic in all the schools, and anything approaching a radical change must show accredited credentials before it can command recognition in any school. But treatment is not all that figures in the realm of uncertainty; diagnosis, prognosis and cure are all more or less unknown quantities. Syphilis may exist with any other disease, and, hence, except in the primary stage, possibly it may be so complicated with other affections that certainty is a doubtful question.

The uncertainty grows as the secondary and tertiary and hereditary stages are reached. The prognosis and treatment, too are, then correspondingly impaired as a mathematical factor. But the cure; strangely enough no syphiologist on earth can tell to an absolute certainty when a perfect cure results. In the symposium upon syphilis edited by Professor Morrow, which is as good a digest of the subject as can be found, not one of the twenty-three writers presents a line of treatment that can be confidently relied upon for a permanent cure. This applies to the eye as well as to the other tissues of the body. From my own reading and observation I am firmly of the opinion that drugs never eradicated the disease in any single instance. Once a syphilitic, always a syphilitic. The disease may be suppressed by the aid of medicines or by the system alone; but to so perfectly annihilate the trouble that it is not liable under favorable circumstances to show itself again, I do not believe to be possible, in the present state of medical knowledge. This is only a matter of opinion. Others may have made investigations that convince to the contrary. Still it's an open question. The best specialists the world over have reported cases of supposed cure that years afterwards have again developed in the same individual or in their children. Again, cases are on record in which Mercury, Potash, Iodine and other remedies alone and in combination have been pushed to the limit of endurance, and still no cure.

Again, our hopes have been tickled with a straw in the announcement that bacteriology has lent a hand that the hitherto elusive little microbe has been given a coat of seven colors and feasted on raw potato or ginger snaps, and made to give up the secret of his power. Then comes the report that the man in the laboratory discovered another microbe, which latter shows that his hind sight is better than his first sight, and every man in the land sheathes his hypodermic and returns to his inunction.

The questions naturally arise: (*a*) Can the physiological and the pathological changes be accurately enough determined in their significance to establish a basis for conclusive investigation? (*b*) Can the cases be kept under systematic management long enough to enable us to arrive at definite conclusions? (*c*) Can any arrangement be made whereby a large number under the physiological action of drugs can be compared with an equal number under the exclusive action of at-

tenuated drugs? Given a profile view it looks feasible enough to answer all these questions in the affirmative, but looked squarely in the face the aspect changes. They are all very doubtful of accomplishment and equally so in respect to the diagnosis. In so far as diagnosis rests upon the testimony of those afflicted, I do not fully agree with a certain old Scripture gentleman who said in his haste that all men are liars; but I do believe that most men and women who are tainted with this disease are egregious prevaricators, which should have been noted in the new version. In the primary stage there is comparatively little doubt; the doubt increases in the secondary, still more in the tertiary, and in the hereditary form it fades into great uncertainty as to its being syphilis pure and simple. All this, however, is no particular reason why we should have an attack of pessimism. The itch was a mystery for many a generation, but the microscope with the eye of a bacteriologist at the right end of the instrument rang the knell of its incognito.

Shall syphilis forever remain a mystery? Although many cute observers have so far failed to prove it to be a germ disease, it is still investigated along that line in the most confident expectation that a staining process and a method of culture will yet be developed which will put the question of its nature at rest. In the meantime it is our duty as specialists to find if possible a remedy or remedies which will, if it be a germ disease, neutralize its toxin; or if it be a disease purely dynamic to meet the symptoms on their own ground. It does not seem far-fetched to believe from the evidence already at hand that the nature of all diseases will eventually be clearly understood, including, of course, those of our department. With the nature of diseases laid bare, it is not hard to believe further that measures for a prompt cure will be forthcoming. This together with the preventive agencies coming to the fore, we may reasonably expect that future generations will escape most if not all the ills that affect the unfortunate of our day.

In regard to the paper under discussion, the writer has left no room for adverse criticism, but he left a roundabout opening for generous compliment which I am happy to bestow.

G. De Wayne Hallett, M. D.—The essayist hopes for a definite answer to the question as to whether an obscure condition, which improves after specific treatment, should be classed as syphilitic. It certainly would be a comfort to have this settled, but since the drugs which make up this treatment are also given and do modify diseased conditions which are not syphilitic—as Iodide of potash in arterio-sclerosis, and Mercury in chronic plastic iritis—it is difficult to draw conclusions in doubtful cases or those not acknowledging the initial lesion. However, where the weight of evidence (somatic, initial and local in the eye), inclines ever so little to a specific origin, and that condition clears up under this treatment, the classification is fixed.

From observation and reading I believe this to be the usual proceeding. It is the cases that do not in the main lean toward syphilis as a cause, and yet by some one prominent feature compel us to consider it, that put us in the greatest quandary.

As Dr. Fellows well says: "The evidence is so often commingled with that of alcoholism, senile changes, arterial disease, as well as those of the kidney and heart, that it is well-nigh impossible to distinguish between them."

In regard to the initial sore of syphilis being other than a hard chancre I can find no authority for such a supposition other than that presented by Dr. Fellows. It has always seemed that the unreliability of the patient, both as to his own observation of the sore and the modification according to location, the misleading statements quoted from the physician first consulted, and the presence of other disease at the same time, was enough to obscure the evidence as to the hard or soft character of the chancre in cases not well marked, and render diagnosis dependent upon the secondary symptoms.

However, I must acknowledge having had cases in general practice where I had to await the development of further symptoms before I could feel sure that the sore I had treated through all its existence was a hard or soft chancre.

Dr. Fellows says: "Authorities are changing their opinions, and Fournier has changed his views from this extreme to advocating as his belief that *soft chancre or suppurating buboes are frequently followed by constitutional syphilis.*" I can find no American authority for such a claim, and Dr. Robert Taylor, with whom I was in conversation a few days ago, says that he is in frequent communication with Fournier, that he never heard of such a view and does not believe that he entertains any such opinion.

Dr. Bukk Carleton is positive in asserting that every syphilitic chancre is a hard chancre.

Dr. Carleton also thinks eight weeks the earliest date for specific eye affections to appear. In my clinic this spring I had a gummatous iritis, which lighted up just seven weeks after the development of the chancre, and I now have a case of neuro-retinitis syphilitica occurring twenty-eight weeks after chancre.

In no class of conditions could a greater mistake be made than to treat syphilitic eye affections as local troubles and amenable to local measures. The period of the general disease and its manifestations in other parts of the body and the character of any previous treatment the patient may have had must be considered.

It would be interesting to know how Mercury and Potash act in the system, and without claiming to present a solution of this question, I may be permitted to present a few statements bearing upon the subject:

Mercury in its chemical compounds is easily taken into the system, is soluble in the blood and passes into and remains in the tissues as the oxyalbuminate of mercury. It may be that the mercury enters into chemical union with the albuminous substance of the peculiar bacteria of syphilis, for there is believed to be a definite germ, the discovery of which has been several times announced, but not proven.

Dr. Samuel O. L. Potter, in the eighth edition of his Materia Medica,

Pharmacy and Therapeutics, says in quoting Dr. Ringer: "The phenomena produced by Mercury are singularly similar to those which will result from syphilis, and the serious symptoms known as secondary and tertiary syphilis can be produced both by syphilis and by Mercury. The drug is a specific antagonist to the syphilitic virus, probably by reason of its affecting the same organs and tissues of the body on a similar line of action, both poisons mutually destroying each other in the organism."

"Iodide of potash (Potter) combines with Mercury and the products of syphilitic disease in the system and hastens their elimination." And by Ringer: "Insoluble compounds of Mercury with albuminous substances in the tissues are redissolved by Iodide of potash, and it brings one or the other again into the circulation and so resubmits the system to its influence, and it also promotes the elimination of Mercury by the urine and thus helps to free the system of its pernicious effects."

Mercury is homœopathic to syphilis, as will be observed in the proving of this drug, and it is to be noted that the symptoms were taken in many cases from workers in the mercury mines, artesians, provers and experiments upon animals, takers of both large and small doses. In the mouth, stomatitis, salivation, bluish line along the gums, periostitis of the alveolar processes, fetid odor, and swollen parotid and submaxillary glands. In the alimentary canal. increased pancreatic secretion, increased action on the part of the cecum, colon and rectum, negative effect or reduced secretion of the bile, and congestion of the liver. On the penis two provers had balanitis, and another vesicles, which became ulcers with round overhanging edges and a cheesy colored base. Other observers report ulcers on this organ and on the vulva.

On the skin, eczema rubrum, vesicles and eruption resembling measles, and exfoliation of hair and nails. Some reported nocturnal bone-pains and periostitis. On the nervous system, a peculiar tremor, increased susceptibility to impressions, wakefulness and general uneasiness, and in grave cases when the tremor has existed for a long period, mental weakness, delirium, hemiplegia and coma.

Bartholow reports as a result from long continued inhalation of mercurial fumes plantar anæsthesia, muscular inco-ordination, ocular disorders and locomotor ataxia.

The provings of Iodide of potash show that this drug is also homœopathic to syphilis. It produces a rash much like acne, always hard, shotty and indurated papules, which may be broad and large.

The secreting glands are first stimulated to increased action, and, later, there is a diminution coincident with atrophy of the organ. Indurated lymphatic glands. Long continued use of the drug causes anxiety, insomnia, palpitation and tremors; one individual presenting violent headache, dilated pupils, nystagmus, tremors and hæmiplegia. Ricord is quoted as having observed transitory amaurosis due to subretinal œdema. Finally, both these drugs produce a cachectic anæmia.

Pierre Jousset, in his Practice of Medicine (American edition, 1901), containing the homœopathic treatment of diseases, says on page 61:

"We will now speak of doses, and as we are certain to raise a storm, we are happy to be able to shelter ourselves under the authority of a master like Hartnmann," who is quoted as saying, "I usually prescribe *Mercurius corrosivus* in doses of 1-10 of a grain several times a day," and "still increasing the dose," and also "the precipitatus rubra in doses of 1-8 to 1-16 of a grain, three times a day." Jousset says he introduces no innovation in the treatment of syphilis, and that the old school have acknowledged two Hahnemannian laws in administering Mercury not to the extent of purging or salivating. Jousset advised the Protoiodide of mercury, 1 to 3 grains twice daily by the stomach, or 5 grains of mercurial ointment rubbed in nightly for six days, a rest for nine days, and to be continued for several months. Of Iodide of potash he gives 1½ to 2 grains daily, and in exceptional cases increasing to 10, 20 or 30 grains. A period of treatment is followed by a period of rest.

Specific endarteritis is rarely seen and resembles very closely in its appearance ordinary senile sclerosis. In fact, diagnosis depends upon concomitant syphilitic lesions. The picture presented is of visible opacity of the walls of the arteries and rarely of the veins, with lateral white lines, or in places the vessel walls may be covered with a grayish-white opacity. As in senile sclerosis the disease produces a narrowing of the blood columns. Extravasations of blood occur which feather along beside the ramification of an artery, but also occur in other parts of the retina where the supplying artery cannot be seen to be affected. There may also be an increased fullness of a vessel at some point. More rarely there will be about the macula circumscribed white degenerative spots as in albuminuria.

Haab, of Zurich, says: "Frequently the effect of treatment gives the first clue to the diagnosis," so it is evident that cases in which there was an absence of all concomitant leutic manifestations were decided solely by the effect of Mercury and Potash on the defects observed.

To the question of Dr. Fellows: "Is there any possibility of the later manifestations of secondary or tertiary syphilis, and particularly as it affects the eyes in those cases which deny the original infection, but who do admit an initial attack of gonorrhœa, with possible recurrences?" I would answer no. In regard to brain syphilis and the quotation of Patrick that it is most frequent in the first year, Bukk Carleton says such effects are due to toxins and are not gummatous. Starr states that nerve syphilis is most frequent in the third year, but may occur in from three months to twenty or more years.

A. B. Norton, M. D.—I had one case this winter of syphilitic eye trouble that I regard as interesting and extremely rare. A child seven years of age was brought to the clinic with an attack of syphilitic iritis and with a gumma of the iris. Never before in my experience had I met with gummatous tumors of the iris in a child, and I was in doubt if gumma tumors in the iris could be one of the results of hereditary syphilis. There was penty of evidence that the child was affected with hereditary syphilis; there had been previous treatment for parenchymatous

keratitis and lesions of the teeth and nose. There were two tumors in each iris about the size of the head of a pin, which absorbed rapidly under ordinary remedies together with the use of atropine. I inquired of Dr. Laidlaw if we could have gummatous tumors on the irides in hereditary syphilis, and he said that the question had never come up before so far as he knew. He looked the matter up and found authority for the occurrence of such tumors in inherited syphilis. I should like to know if any other member has ever seen similar growths as a result of inherited syphilis.

G. A. Suffa, M. D.—I have two cases of syphilitic iritis under treatment that are practically the same in character. Both patients are women of about the age of fifty years. One case came under treatment about three years ago with active iritis in one eye. She had had attacks previous to the time that I saw her, and there were in that eye numerous broad adhesions. Atropine was not able to free them, although there were spaces that were free. The other eye showed no involvement in any way, so far as previous iritis was concerned. Vitreous opacities were present and vision was reduced to $^{22}/_{100}$th. The fundus could not be seen clearly at this time.

In the other eye there was evidently choroiditis and probably neuroretinitis. After treatment when there had been considerable absorption, the vision remained below normal, $^{20}/_{40}$ in both eyes. She left me for some time, and when she came back this winter after quite an interval the vision was down to where it was when I first took her case. The first time she responded quite readily to treatment, but this time, although five months have been consumed, yet there is very little improvement. The eye that had no adhesions has developed them without any external evidence of iritis whatever. There were seven broad pigmented adhesions formed since I treated her the first time. I tried to dilate the iris but could not. The second case came to me at about the same time as this one, and very much in the same condition. She had been under treatment for some time by a general practitioner. There was no active iritic inflammation at any time in either of the eyes; there was plenty of synechia. One of these cases had a clear history of syphilitic infection, the other not. Is there anything to be gained about the history of their cases when there is any syphilis into it by doing an iridectomy in such cases?

W. R. King, M. D.—I am sorry that I did not hear the paper, but the general subject has great interest to me. The discussion has brought one or two thoughts to mind. Just when syphilis is cured is a difficult thing to decide. The doctor does not live long enough to know whether the syphilis is cured or not, neither does the patient. Other troubles will carry them both off before the question is settled. In regard to the point made by Dr. Norton relative to the occurrence of gummatous tumors in the eye of infants, pathologists assure us that they may develop in that way. The taint may show in the ear, eye, nose or throat of infants. I do not know how far back we must go to get the history of a given case of

syphilis. You may have to go back for several generations, and hence I agree with Dr. Bissell about the liars so-called. They may be perfectly honest in denying it. With reference to the results of treatment, we should be very conservative in our claims of cure, for symptoms may crop out after a long period of immunity, and twenty or thirty years after the first infection. I have one case that I began to treat twenty years ago, immediately after the primary infection. The young man was extremely tractable, believed thoroughly in me and did just what I directed.

He has had absolutely nothing but homœopathic remedies, and I know about it. I have watched him and his family, and there has never been any indications of hereditary syphilis in the children, aged eleven and fourteen. He has never had any serious illness since I began to treat him for this.

Another case referred to me for some trouble in the eyes proved, on examination, to be decided, characteristic, progressive keratitis, with considerable destruction of tissue. The vision of the right eye was reduced twenty-five per cent. The case has almost recovered. Dr. Custis prescribed for this patient, and nothing has ever been given except the homœopathic remedies given absolutely upon the homœopathic indications. Locally, I used only massage and the galvanic current. The patient passed through all the stages; he did not miss a single stage; throat, skin and alopecia, he had them all, and then the eye symptoms. This was about seven years ago. He is now entirely well. I saw him but a few days ago. His left eye is normal, the right eye has about $^{8}/_{45}$th. He attends to business, but as I said, twenty years from now he may develop unmistakable symptoms of syphilis. I won't be here to treat him, and I have no doubt he will have forgotten that he ever had the complaint, and will become one of the liars for the next generation of doctors.

C. G. Fellows, M. D.—While writing this paper and looking over the literature of syphilis I got very much interested in the subject. Someone asked whether I used inunction; certainly, I use plenty of Mercury and plenty of Potash. Why shouldn't I? They are homœopathic, and they are physiological.

The main point that came up in my paper was as to the proper time for homœopathic remedies, and it made me feel better than before when I realized that after the physiological and antidotal action of the Potash and Mercury to control the effects of the disease, we come to a point where the homœopathic remedies will have a chance to do something. Most specialists do not see syphilitic cases of eye trouble in their own patients, but they come to us after two or three years of full dosage of Mercury and Potash, at the end of which time our homœopathic remedies will help.

If we can help and restore muscular paralyses, and absorb infiltrations with our remedies, why can we not prevent or restore the destruction of nerve cells and tissues after the crude dosage has done its work? I be-

lieve that it is impossible to have secondary or tertiary symptoms without primary ones, but we can see how the idea was originated. Such patients must have had a chancre, either concealed in the urethra or so slight as to escape their notice and that of their physician.

The only thing that I could not clear up satisfactorily was how much gonorrhœa had to do with syphilis. It seems to me that there are a number of specific diseases and inflammations about the eye that owe their origin to gonorrhœa. The authorities that I quote I intend to put at the end of the paper in the form of a bibliography. My chief authority is a series of articles read before the American Medical Association. It still seems to be a question whether syphilis can follow soft chancre. Authorities still differ upon this long mooted point.

ANGIONEUROTIC ŒDEMA OF THE LARYNX—TRACHEOTOMY.

BY N. H. HOUGHTON, M. D.,

Boston, Mass.

ON December 4, 1902, there was admitted to the Massachusetts Homœopathic Hospital, Mr. R. E. D., age 46, an Englishman by birth, about whom the hospital record is as follows:

"Mother died of diabetes, otherwise family history negative. Good health, except he had an attack of sciatica in 1899. Present illness began in September, 1902, with pain between the shoulders, extending down into the hips. He was troubled about walking, and could not turn over in bed without taking hold of the headboard. These pains seemed to come on when he first awoke in the morning, and would wear off during the day. There have been cramps in the legs, and about the middle of October there appeared a swelling on the bottom of the right foot, and since then all the pains, as described above, have been worse. Has used whiskey habitually. An examination of the chest and kidneys was negative. Diagnosis: Rheumatic gout. On December 13th, there appeared œdema of the penis and scrotum, for which he received *Apis*. This œdema soon disappeared. On January 10th, he was attacked with cramps in the abdomen, followed by another appearance of œdema of the scrotum and penis. January 16th, foot better; cramps in the abdomen still continue; œdema of the scrotum has disappeared, but patient complains of a fullness in the throat. January 17th, in early morning patient complained of inability to swallow, and later in the day, medicine is regurgitated through the nose; attack supposed to have come from eating fish the previous day; at evening there was marked œdema of the throat."

About eight o'clock I was summoned, by telephone, to the hospital, and, on entering the ward, I found the patient bolstered up in bed, breathing with great difficulty, forehead bathed in drops of perspiration, face and neck congested and swollen. A complete picture of laryngeal stenosis. An inspection of the throat showed a very large œdema of the uvula and faucial pillars, so large that it was impossible to properly introduce a mirror and thus obtain a view of the larynx. The breathing was constantly getting worse, and the patient said, in a whisper, that if he didn't get relief soon he would be where he would

not need it. With a knife I punctured the uvula and faucial pillars, hoping that the escape of the fluid would give an opportunity to again use the laryngeal mirror and inspect the larynx; but there was no relief, and immediately the man began to struggle for breath with all the strength with which he was endowed, followed by convulsions of suffocation, so strong that we had difficulty in keeping him from falling out of bed. Becoming completely cyanosed, respiration having stopped, he dropped down on his back apparently dead. There now remained but one thing to do, and that was done as hastily as possible. There was no time to look for landmarks, nor to scrub the neck of the patient, or for the operator to make his hands aseptic. A knife was seized and the second cut penetrated the trachea just below the cricoid cartilage. The index finger of the left hand followed the knife, and by the combined outward pressure of the finger and knife the trachea was kept open, while two of the internes at once began to perform artificial respiration. In a few moments we were rewarded by the advent of returning respiration. A tracheotomy tube was next procured from the operating room, and, being inserted without any difficulty, was held in position in the usual way. After cleaning the patient, and I assure you there was great need of it, as there is no claim made here for the bloodless operation, he was placed in a private room under the care of a special nurse.

January 19th, two days later, the œdema having disappeared, and the breathing having become natural, the tube was removed and the wound was cleansed, dressed with aristol and collodion, and the patient was sent back to his former bed in the ward. At no time was there any suppuration from the wound, and the healing was all that could be desired. In trying to learn more about this man's history I have obtained the following facts, which I present to you in his own words:

"——— I have been subject to these swellings since a boy, and have had them practically at one time or another all over my body, more often in my scrotum. When they first began to appear they usually came with an itching and burning sensation and lasted a few hours. As I grew older they seemed to last, on an average, about thirty-six hours, from start to finish. I have had them two or three times in my head, before this present attack, and each time they have been getting worse, my face being so badly swollen I could not see out of my eyes for about twelve hours. It then began to go down of its own accord. I have had seven of these swellings since I came to America (eight months ago), and have noticed particularly each one after eating fish; also, in most instances, the swellings have been preceded by severe pains in the stomach. I have a sister (age 41 years) who suffers very much in the same way as myself; she has been under thirty doctors, not one of whom has ex-

plained the disease or complaint. She was, when I left England, in May last, under the care of Sir William Broadbents, of London. I do not know the result of his treatment. The last time she had a swelling in her throat and face, two doctors were there awaiting to perform tracheotomy, but the swellings subsided without the operation. She also suffers with acute pains in her stomach before the swellings come, and often has to have morphia injected. My father used to suffer with these swellings, I am told, and died from asphyxiation, by the side of his bed, before help arrived."

On February 1st there was another sudden attack of œdema of the genitalia, which disappeared two days later. Before this attack there had been no ingesta of fish. In a few days the patient, having been cured of his rheumatic gout, was allowed to depart from the hospital.

In a recent interview with this man he informed me that during the last of April he had still another attack of œdema of the genitalia, which, like the previous ones, was preceded by abdominal pains, came on suddenly and as suddenly disappeared. This last attack did not incapacitate him from his work, that of a butcher. At no time since he left the hospital has the man eaten fish. I make mention of this fact because it was his belief that these attacks were due to eating fish, and, also, because I find that one writer has mentioned fish as sometimes causing the disease.

Now, certainly, here is a very unusual state of things, a man struck down, as it were, with a dozen or more attacks of œdema in as many months, and one attack all but producing death. Believing that these sudden attacks of œdema might have some nervous origin, I turned to my friend, Dr. E. P. Colby, Professor of Nervous Diseases, in Boston University School of Medicine, and he suggested that it was quite likely a case of angioneurotic œdema. This most timely suggestion has brought order out of chaos, and as I have studied this subject, I have become convinced that this was what we were dealing with.

Angioneurotic œdema[1] is described as an acutely appearing œdema, either circumscribed or general, occurring suddenly, as the result of vaso-motor disturbances. These disturbances are those of innervation rather than of inflammation. The disease is closely allied to urticaria, and has been described under the heading of giant urticaria and urticaria tuberosa. Angioneurotic œdema is considered to be an uncommon disease, about which little is known and has been written. The first to write about this disease were Quincke and Milton, the latter's paper being published in 1876, and since then the contributions have been few.

Probably all physicians present have seen some manifestations of this

disease, but, perhaps, did not recognize it under its true name. I remember a young lady of a decidedly neurotic nature, who, at every menstrual period, would have a very marked œdema of one knee. Another case was an œdematous swelling of one side of the face, especially involving the upper eyelid, and still another case was where the œdema appeared in the upper lip.

The œdema more commonly appears upon the extremities, but may invade the body, face and the mucous membrane. When the mucous membrane of the larynx is involved the condition becomes very dangerous, and a number of deaths have been recorded. Dr. Clarence Bartlett[1] describes a case of his own where there was swelling of the entire body. He also refers to several cases of other writers.

In 1889 Osler[2] reported a case of hereditary or family form of angioneurotic œdema, where the disease had affected members of the family in five generations. In one instance, possibly two, death resulted from a sudden œdema glottidis.

T. W. Griffith[3] records a family in which the father and daughter presented these localized swellings from infancy. The father had three attacks affecting his throat, and the last caused his death. The daughter died in the same way, and the autopsy showed great œdema of the mucous membranes, connective tissue and muscles of the larynx entirely occluding it.

Other cases have been reported by Raven[3], Robert Lewis, Jr.,[4] and Onut.[5]

The causes of this disease are not dependent upon renal, cardiac or hepatic lesions, but on conditions existing in the system which bring about vaso-motor disturbances in people of a neurotic type. Individual attacks are provoked by exposure to cold, indigestion, certain kinds of food, fish, anxiety, mental excitement and traumatism. Alcoholism is known to have induced these attacks. Although I have not seen it mentioned, yet I believe that uric acid will be found to be a common cause.

In regard to treatment there is nothing specific to be mentioned, but especial attention should be directed to the underlying bodily condition. Everything should be done to bring about the normal tone and stability of the nervous system.

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[1]Practice of Medicine, Goodno, p. 884.

[2]Annual of the Universal Medical Sciences, Sajou, 1889, P. B. 47.

[3]American Year Book of Medicine and Surgery, Medicine, 1903, p. 436.

[4]American Year Book of Medicine and Surgery, 1899, p. 749.

[5]American Year Book of Medicine and Surgery, Medicine, 1900, p. 408.

THE USE OF THE ROTARY MASSEUR IN MIDDLE EAR DISEASES.

BY J. H. BALL, M. D.,

Bay City, Mich.

IF one should attempt to base a definite conclusion of the utility of massage in the treatment of deafness upon the records of results as we find them in our literature, he would soon be lost in the maze of conflicting opinions.

While it may be that my ideas as expressed in this paper will only add to the confusion rather than clear the haze, still I do feel that my results with the rotary masseur are sufficient to warrant my adding to the record.

I can not sum up my experience in as few words as one of our members did when he said: "He would be glad if someone would tell him if massage had been a success in his hands," for after your years' use of the present method I feel that there are conditions in which its use is a decided success.

It is my opinion that the unsatisfactory results so frequently recorded are due to not carefully studying and classifying the cases before treatment is applied.

It must be conceded to begin with that a large percentage of the cases met in practice are incurable or of so long standing as to be in no way amenable to treatment when they come to the hands of the physician. This being true, it is only just that such cases should be recognized in the beginning and not tabulated in our records as failures after several weeks' treatment, when it should have been recorded incurable to begin with. The shot-gun method of applying massage to every case of deafness is far less productive of results than is empiricism in other lines.

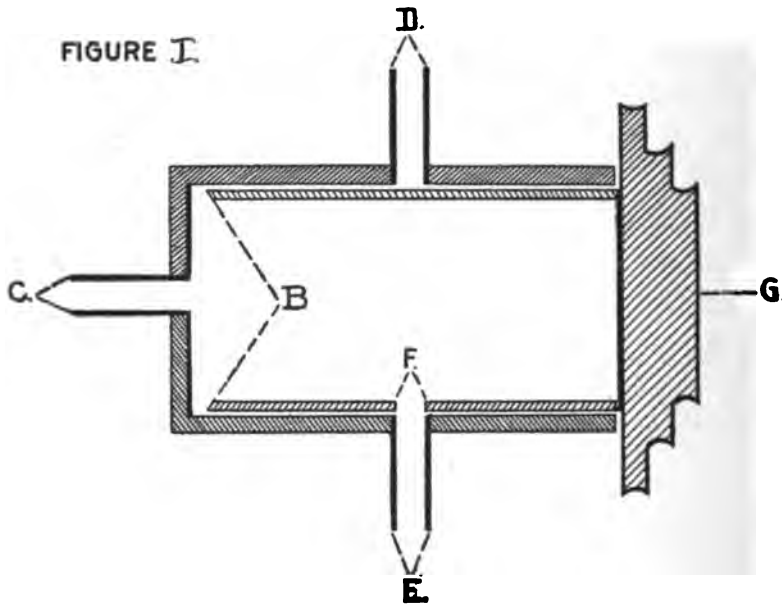
The efficiency of any method of treatment over another is established only after being carefully compared side by side with the other forms of treatment. So with massage, its efficiency can best be determined by noting its results in cases where other forms of treatment fail.

I am satisfied that there are forms of middle ear deafness which at

certain stages are curable, while at other stages only a partial restoration of the function can be expected.

It is to this condition as well as the method of treatment that I shall direct my efforts in presenting this paper.

The form of deafness which calls for the use of massage is essentially one of disturbance in sound conduction rather than in its reception or preception, and necessarily of catarrhal origin.



The pathological changes are the result of the long-continued catarrhal otitis. The changes in the mucous membrane consist mainly in an increase of fibrous tissue, in consequence of which it becomes dense and inelastic. Especially is this true of the ligaments which support and bind the ossicles together. The inflammatory changes in the Eustachian tube close this orifice so far as the passage of air to the middle ear is concerned. This reduces the atmospheric pressure within the middle ear, and in consequence increases external pressure on the tympanic membrane, together with a gradual contraction of the tensor tympani from inflammatory changes, a depression and gradual stretching of the membrane is brought about.

The changes in the ligaments of the ossicles combined with the pressure on the membrane increases the pressure directly on the ossicles

producing an increase of pressure on the foot plate of the stapes in the oval window; in proportion as the stapedio-vestibular ligament is involved is the foot plate impacted in the oval window; the increase of pressure in the oval window is not compensated for by yielding of the membrane of the round window because of the inflammatory changes in it; the result is an increase of intralabyrinthine pressure.

The ligaments of the ossicular chain suffer to a great extent. The capsular ligament of the malleo-incudal articulation becomes relaxed, and because of the relaxation of the ligament the entire drum membrane and the tip of the handle of the malleus may be carried inward toward the tympanic wall by the rotation of the handle of the malleus upon the axis band.

Deposits of new tissue may take place, forming adhesions in ossicular articulation or bind them to the osseous walls.

Symptomatology.—The symptoms of the condition as the patient presents them are likely to be very much alike in all cases whether curable or otherwise. Loss of hearing, tinnitus from the increased labyrinthine pressure, and aural vertigo may be present from the same cause; an especially favorable symptom is that of hearing better or worse according as atmospheric changes take place.

The hearing is particularly depressed in damp weather. Another favorable symptom is that of hearing better in a noisy place. While the patient may still retain the power of hearing the sound of the voice they are unable to differentiate articulate sounds.

Inspection will show the tympanic membrane retracted. In case of long-standing the retraction will be marked, causing the handle of the malleus to stand out distinctly; this member is likely to be rotated on its axis and have a dead white color. The membrane has a lustreless, stretched appearance. If the Eustachian tube shows little or no obstruction, the membrane will likely be immovable except at points where it has been over-distended by pressure; the part over the malleus will remain fixed.

This symptom marks the case as unfavorable and beyond the reach of the masseur.

In the favorable case we find an obstructed Eustachian tube; the membrane shows retraction but not so marked, and it not so lustreless; handle of malleus may be rotated some but the membrane is not so markedly depressed about the handle. Inflation of tube will show the membrane and ossicles movable and not fixed. This condition is favorable and will show results from proper treatment.

Where bone conduction is impaired to any extent or shows nerve disturbance to an extent proportionate to the disturbance of hearing, no results can be expected from treatment.

The treatment is begun by relieving the obstructed Eustachian tube. This is accomplished by means of air pressure conducted through a "Globe-multo-nebular vaporizer," where the pressure is at all times completely under control. Can be applied steadily and with any amount of force desired. For these reasons it is more easily manipulated than the politzer bag, while it is as effectual, as, and far less objectionable, to the patient than the Eustachian catheter.

Following this the rotary masseur is applied to each ear separately from two to five minutes.

The rotary masseur, as many of your are aware, was designed by Dr. Harold Wilson. The principle of its action is that of rapidly changing from a pressure above or below atmospheric, whichever is used, to atmospheric pressure.

It consits of two cylinders, one revolving within the other. Figure 1 shows a cross section; by it A represents the outer cylinder, which is stationary; in it are three openings, C, D and E. The other cylinder, B, revolves inside A; it has one opening at F, the end at B, of course, being open, while at G is a pulley for attaching it to a motor. The opening C is connected with the ear, while E is attached to the pressure tank. The pressure or suction is applied through E. When by the revolution of cylinder B the opening F is brought opposite E, the pressure in B and in the ear is made the same as the pressure in the tank. The revolution of the cylinder next brings the opening F opposite D, and immediately the pressure in the cylinder B and the ear exhausts to that in D, which is that of the atmosphere. The frequency and length of the vibration is of course dependent on the rapidity of revolution and size of the cylinder.

In my own practice I make use of three forms of vibration. In the first pressure from a compressed air tank is applied at E. By applying a steady and constant pressure we here produce a vibrating pressure, for the rapidity of revolution of the cylinder does not allow the pressure to completely exhaust to that of the atmosphere at each revolution.

In the second a vacuum is applied at E, giving us a vibrating suction exactly the opposite of the first.

In the third a large Politzer bag is attached at E. Pressure applied to the bag, of course, produces a vibrating pressure as in the first form, but instead of being constant it is a pressure that is steadily decreasing

as the air is exhausted from the bag. The release of the bag after the air is exhausted produces a suction which gradually decreases as the bag is inflated.

This last form is the one which I have found to give the best results in the majority of cases. In applying, it is commenced with suction, which pulls the tympanic membrane out, constantly vibrating it, while it is gradually allowed to return to place. When pressure is applied it forces the membrane in while vibrating it, and gradually allows it to return to place. The suction brings the membrane out from its retracted position, relieves the ossicles from their impaction, stretches the contracted ligaments, distends the blood-vessels and reduces pressure in the labyrinth; pressure following relieves the tension produced by the suction and brings the ossicles back to place. This is productive of all the desirable results of exercise by muscular contraction and relaxation.

There are, of course, many points that need careful consideration in applying treatment. In a general way rules can be made, but they must be varied as conditions arise.

The question of length and force of the vibration is one that is governed by the patient's condition. The short, rapid stroke produced by from five to nine hundred revolutions per minute, extends its effects more to the labyrinth, while the slower and longer vibration as produced by from fifty to two hundred revolutions produced a more distinct jar to each stroke, and gives its effect to the tympanic membrane and ossicular chain.

Care should be used, however, in applying the longer vibration where there is an atrophic condition of the tympanic membrane or ossicular ligaments, for too long and forcible a vibration may separate the ossicles so far that they will fail to return to place. With the short, quick stroke this danger is obviated.

The length of a treatment must be governed by the sensitiveness of the patient, as must be the force of vibration applied. Never use force enough to produce pain, and never continue treatment after patient complains that the ear feels sore. Do not apply a second treatment until any irritation produced by the former one has subsided.

In summarizing the results of treatment I will briefly detail two cases.

In the beginning of the paper I stated that the efficiency of a form of treatment was established only by comparison. Case one will fully illustrate this, as will be shown,

Case One. A woman thirty-eight years of age. Married. History of progressive deafnes of six or seven years' standing. Had been treated

more or less constantly with no result. Last treatment was received from two prominent aurists in Michigan, who both pronounced the case beyond help. January 21, 1902, she consulted me. I found conversation only possible at two feet, and then in a very loud voice; could not hear watch on contact in either ear. Bone conduction at mastoid was normal.

Tympanic membrane was moderately contracted, but movable, light spot nearly gone, handle of malleus slightly rotated. Eustachian tube badly obstructed and tinnitus very persistent. The tubes were opened by the method I have previously explained and massage with rotary applied for about three minutes at a sitting, three times a week.

Improvement became apparent from the first. Tinnitis gradually lessened and practically disappeared at the end of two months.

February 21st was able to hear watch on very close contact, while conversation in ordinary voice was possible at six feet. Improvement was gradual until August 14th, when the case left the city and passed out of my hands. At this time the tinnitus was entirely gone, conversation in an ordinary voice was possible at twenty feet, but watch could only be heard on contact.

Within the past month I have heard from the case and am informed that there has been considerable improvement since treatment ceased. She can now hear watch at three or four inches.

Internally, the patient first had *Graphites* 3x; later this was changed to *Kali mur.* 3x. Several times during treatment there was a return of the tinnitus arising from menstrual disturbances; here *Cimicifuga* 3x brought quick relief.

I feel that this case is an important one because of its history. The old line of treatment had been carefuly and persistently tried, with the result that the case was pronounced beyond help.

Case Two.—The only other case which I will mention is that of a boy twelve years old, history of deafness two years standing. Watch heard only on contact, conversation in ordinary voice possible at six feet. With tuning fork on mastoid bone conduction was normal, membrane contracted, Eustachian tube closed, tinnitus.

Treatment in this case was inflation of tube and massage three times a week At the end of two months watch could be heard at fifty inches, and conversation in low voice at thirty feet without difficulty, tinnitus entirely gone.

In acute catarrhal otitis, non-suppurative, good results have been obtained. It shortens the duration of the attack, relieves many of the annoying symptoms immediately. The Eustachian tube is restored to its normal condition much more quickly under massage than without it, and the danger of permanent disturbance from changes in the mucous membrane and contraction of the ligaments is greatly lessened. The effect upon the tube is often very apparent. The patient frequently

speaks of the sensation of the massage being felt in the throat, due, undoubtedly, to its effect in the tube.

In acute suppurative otitis media the use of the steady vibrating suction is very efficient in addition to the usual form of treatment. It helps to free the middle of the discharge, stimulates the circulation, prevents adhesions and shortening the duration of the condition very much.

In conclusion, while it cannot be said that massage is the climax of the treatment of deafness, and while it does not reach all conditions, still the fact that we are able to show results where the old and time-worn methods are useless is enough to cause it to be given, at least, consideration.

The time may come when a perfect method of treatment will be evolved. If it does it will only be reached by using the defects of each successive method as a stepping stone to mount higher.

DISCUSSION.

John L. Moffat, M. D.: I agree with Dr. Ball that cases treated with massage should be carefully diagnosed and classified, and that the apparently incurable cases in which it is tried tentatively should be studied in entirely separate statistics. But I do not agree with him that aural massage is of benefit only in chronic catarrhal otitis media with unobstructed tube and mobile drumhead; these are the cases, however, in which we can give the more hopeful prognosis.

I have not used the Wilson rotary masseur; it might be valuable, in connection with a large Politzer bag, by steadily decreasing vibratory suction or pressure; but I see no practical advantage in it over the Wappler electric controller, which I have used with undiminished satisfaction for over three years.

With the latter one can obtain vibrating suction or compressed or alternate suction and compression, 125 times to the minute, or so rapid (one or two thousand) as to be practically continuous under complete control of the operator.

I always give medicine while using aural massage, hence can only speak of it as an adjuvant. I am satisfied of its value, not only in apparently hopeless cases of long standing, but in recent subacute catarrhal cases. In the latter, three or four treatments have sometimes sufficed, the medicine evidently acting more rapidly than if administered alone.

Permit me to emphasize the value of applying pneumo-massage through the Eustachian tube, not only to dilate the latter but to massage the cavity of the middle ear. After cleansing the nose and pharynx I throw a rapidly intermitting pressive current of heated medicated air backward through one nostril, closing the other, and telling the patient

to swallow repeatedly. Many patients soon learn to hold the pharynx in this attitude so that they feel the air waves in the ear; such dilatation of the Eustachian tube is more certainly and easily attainable through the catheter, and thus should dilate more of it than would the bougie. Has any one present followed bougieing with such infiation?

One other point I wish to emphasize is brief massage with a light touch. Dr. S. complained of long-standing tinnitus with difficulty of distinguishing words, although he could hear the voice; phono- and pneumo-massage as well as internal medication had failed to cure him. A few seconds of most rapid (about 2000 v. s.) pneumo-massage, alternate compression and suction, very quickly increasing and diminishing the speed, gave an immediate sense of clearness in the head and ears with noticeable acuteness of hearing for a time. With a few such treatments at irregular intervals Dr. S. very soon considered himself cured.

I am ashamed to make so unscientific a report, but failed to make notes of the case. *Causticum* 200 was also given, but the effects of the massage were self-evident. Too long a treatment aggravated.

I never give the prolonged treatments that others recommend, but do not apply the high speed for so long a time, as a general thing, as I do the slower rate; five, or, at the most, ten minutes is enough for one seance.

Of late I have queried whether some of the effects of this instrument (the Wappler) may not be attributable to the vibrations through the skull which accompany the air waves; there is also a certain, or rather uncertain, although larger amount of phono-massage incidental to its use. To my mind these add to its clinical if not to its scientific value.

THE LINE OF INCISION AND THE POINT OF DRAINAGE IN IRIDECTOMY FOR GLAUCOMA.

BY GEORGE A. SUFFA, M. D.,

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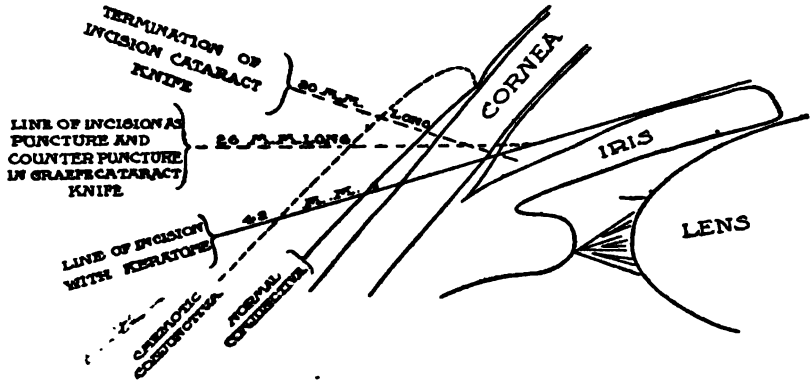
ALTHOUGH a great deal has been written upon glaucoma, throwing much light upon many disputed points, especially in relation to the normal points of drainage of the eye, yet no positive knowledge is possessed through just what channels and in just what way drainage is carried on after a successful iridectomy for glaucoma. Neither have we any knowledge of just what effect the sclero-corneal incision, and the removal of the segment of iris, has during the first days after an iridectomy, especially during the time the anterior chamber remains open. It is the general accepted opinion that the incision should be as far within the sclero-corneal margin as is possible without injuring the ciliary body, iris or lens; in length not less than six to eight millimteers, or one-fifth the circumference of the cornea, and that the iris segment should be correspondingly large, and be removed to its ciliary border by two snippings of the scissors, either with or without tearing away the central portion. This is the iridectomy for glaucoma universally advocated by the authorities and ophthalmic surgeons of today. Treacher Collins, in his Hunterian Lectures, London Lancet, December, 1894, makes the exception when he states: "In an acute glaucoma I do not think there is any necessity, provided an iridectomedialysis be done, to make the incision very peripheral. The iris tears very naturally at its root when drawn upon, wherever the incision is, and a peripheral incision certainly increases the risks of the operation." That the line of incision should be large, one-fifth the circumference of the cornea, and that the segment of the iris should be correspondingly large, and removed as close to the ciliary border as possible, I fully agree, but that the line of incision, to accomplish this, is best placed two millimeters, or more, within the sclera, I do not agree. Believing that the line of incision placed nearer, one millimeter within the sclero-corneal margin will allow a larger incision, one more nearly at right angles to the corneal curve, consequently a

more complete removal of the iris segment, giving a wound that will heal more readily, and thus better fulfilling its purpose under any condition that an eye may be in, in a state of glaucoma.

I furthermore believe that these essentials can more readily be accomplished with a *narrow* Von Graefe cataract knife than with a keratome. In order to demonstrate why I have arrived at this conclusion I have made an accurate drawing enlarged fifteen times from a section of a glaucomatous eye. Here we see depicted a typical condition, one that is usually met with, i. e., iris and lens pushed forward with a shallow anterior chamber. Add to this a chemosis of the conjunctiva, often present, shown in the broken line in black, and we have a condition which makes it still more difficult to make a large, extremely peripheral incision, and to completely remove a large iris segment.



Broken line 26 m.m. long in drawing represents the direction of puncture and counter puncture, and the line 20 m.m. long the direction of incision at termination of incision; obliquity is less at the termination of incision and extends to one-half the length of the incision, gradually increasing to the angles of the cut, but is markedly less oblique, and of shorter penetration than the incision made with a keratome, represented by continuous line.

Drawing a line, beginning two millimeters from the sclero-corneal border until the anterior chamber is penetrated, and comparing the length of this line with the one made at or just within the sclero-corneal border, it will be seen that the distance is considerably greater, and that the incision must necessarily be more oblique in the scleral section, and yet that the points of penetration in the anterior chamber are at practically the same place for both incisions.

Now this being the case, it stands to reason that a cleaner and larger

coloboma can be produced through a sclero-corneal incision, the distance or penetration being so much shorter, than through an incision made two millimeters or more in the sclera. This certainly is true, whether the iris is removed by cutting it away entirely or by partly tearing it away. The closer the primary and final cuts can be made to the ciliary border of the iris the more thoroughly will that membrane be removed. This is even more true if chemosis exists. It also stands to reason that a larger incision can be made for the same reasons. Furthermore a swollen ciliary body, with possible waves of tension, pressing outward in the region of the incision, would have a greater tendency to cause a gaping or bulging wound, in an oblique incision, than one made nearer at right angles to the corneal curve, and thus interfere with a rapid re-establishment of the anterior chamber. It is a welcome sight to see the anterior chamber restored the day following an operation, and is conducive to success not only by giving a clear iritic angle—at least in the region of the coloboma—preventing adhesion by inflammatory deposits, tags of iris—should they exist—or the swollen anterior portion of the ciliary body if the iris segment has been completely removed, but also by a suspension of the cut edges of the iris in the anterior chamber before they have had time to heal. Reasons for believing that the cut edges of the iris during the early period at least take an active part in drainage, especially the ciliary edge, will be given later.

I think at the present time it is generally believed that drainage after a successful iridectomy is through the normal drainage channels, i. e., Fontana's spaces, canal of Schlemm veins, etc., as in the normal eye. Yet I have been unable to find any report of examinations or experiments upon eyes successfully operated upon that show positively that such is the case.

In Collins's report of four successful cases examined after death, "Hunterian Lectures" previously cited, no effort was made to inject any of these eyes with a non-diffusible coloring matter or pigment to demonstrate, if possible, how drainage took place, investigation being confined to sections and microscopic examinations of the angle of the anterior chamber. Case I. would indicate that drainage took place in the normal way, as the iris had not been removed to the periphery in the region of the coloboma, but was free, as was also the iris throughout, giving a free iritic angle in its entirety; thus it is safe to assume that drainage returned literally to normal channels in this case.

Case No. II.—It was not stated whether the iritic angle was opened

entirely or not, simply that the iris segment had been removed to the periphery; so we are left in the dark as to the possible course of drainage in this case.

Case No. III.—The angle of the anterior chamber, elsewhere than at the seat of the iridectomy, remained closed. It is especially to be regretted that no attempt was made in this case to see if injections with a non-diffusible coloring fluid would have demonstrated just how drainage was re-established, if entirely and directly through the spaces of Fontana, or partly through the peripheral or lateral edges of the cut iris. Certainly if directly and alone through the spaces of Fontana their action must have been increased over the region of the coloboma, as this portion of the iritic angle took on the function of the whole angle.

Case No IV. shows that the iris, under certain conditions, is permeable to the aqueous; attenuated and lining the sides of the incision, as it did in this case, it allowed sufficient drainage to make a successful operation. But this does not demonstrate its permeability in the region of the coloboma in the condition it usually is in after an iridectomy. Though I do not think it unreasonable to assume that the cut or torn edges of the iris may lend a hand in drainage by forming free openings into the lymph spaces, and through them into the channel of Schlemm. When we consider the anatomical relations of the root of the iris, both structurally and topographically, there is still more reason for believing this not only possible, but probable, especially when we realize that all the parts forming the angle of the anterior chamber which are concerned in drainage are of mesodermal origin, including that part of the root of the iris which enters into the ligamentatum pectinatum, fibres of which pass into and are intimately associated with all the different structures entering into the formation of this important part of the eye, as well as into the ciliary body.

Structurally the iris contains lymph spaces which communicate with each other, and are continuous with the clefts on the anterior surface of the iris, and with the interstitial clefts in the ciliary body (Fuchs) and probably with the intra-pectinate spaces of Fontana, thus to the canal of Schlemm. The source of the blood supply coming from the short ciliary, the long ciliary and anterior conjunctival arteries, and the corresponding venous circulation of these parts, makes it possible for drainage, after removal of tension, to take place, by way of the venæ vortocosæ, if the more anterior or external sources are blocked. Schwalbe believes that drainage takes place through the iris in the normal state.

Reasoning from these anatomical facts, it will take no great stretch of the imagination to feel that it is possible for the lymph spaces in the iris to remain not only temporarily, but permanently open, or in a condition to allow excretion through them, after they have been cut across, as they are in an iridectomy, and after healing immersed in the fluid of the anterior chamber, with the added necessity for channels for drainage, we certainly have good reasons why these lymph spaces would be liable to remain permanently open so that drainage can take place freely and directly through them.

The other possible factors liable to aid in bringing about a normal state, and to free the drainage channels, are the sclero-corneal incision, the removal of tension and the immediate effect of the removal of the segment of iris. Just what effect the sclero-corneal incision has directly, and through relieving tension, in checking the disease, likewise the cutting of the iris, is at the present time entirely speculative. However, all may have a marked effect in this line, especially the cutting of the iris on account of its intimate connections with the ciliary body. The incision in the outer coat of the eye can only have a temporary effect, after a normal cicatrix has formed; no drainage can take place, as it has been experimentally proven by Schoelar, that the cicatrix is less permeable to the aqueous than normal tissue.

I have yet to see a case of acute glaucoma that does not show more or less inflammation of the iris, and probably the ciliary body is in the same state; excising a portion of the iris at this stage would be very apt to have a sedative effect upon the iris and ciliary body, and thus upon the disease itself, as well as a lasting effect in the various ways previously stated.

The sclero-corneal incision directly, and by relieving tension, immediately and temporarily has a similar effect, perhaps as important during the time the effect is active, but, for reasons previously stated, only while the incision remains open not after the cicatrix is firm.

While the anterior chamber remains open, and until the sclero-corneal incision becomes firm, there exists an altered state of metabolism, which may be termed a stage of transition from the disease to the normal.

Just how much of the cause, or of the condition of the glaucoma, that is removed at this time, by virtue of the incision, the relieving of tension, and the removal of the iris segment, it is impossible to state. That most important changes are brought about during this time, at least in aiding in establishing a cure, and that entirely independent of

the mechanical effect produced by freeing the angle, by the removal of the iris, I hardly think any one will dispute, for it is during this time that nature is making changes in the affected structures, or, in other words, is allowed to assert herself, so as to restore the organ to its normal function, bringing about a cure; if there is a failure of this favorable reaction the disease continues.

During the past winter Dr. Solomon C. Fuller, of Westboro, and the writer conducted a line of experiments on normal and iridectomized rabbits' eyes to demonstrate, or ascertain, the point of drainage, or the line of least resistance, at the angle of the anterior chamber. These eyes were injected, while still warm, with aniline black, immersed in a warm normal saline solution, according to the method described in the System of Diseases of the Eye, Vol. III., page 632. As far as we are able to carry these investigations, they tend to show that drainage, or passage of aniline black, took place much more freely through the iris as a whole than through Fontana's spaces, or the corneal portion of the ligamentum pectinatum. We had hoped to make a more complete report on these experiments, but, as we were unable to complete them, have decided to postpone a more extensive discussion of this subject until after further investigation has been made, merely exhibiting a few of the sections. Careful examination of these sections will show that the iris, as a whole, and the remaining tag of iris after an iridectomy, takes up aniline black much more readily than does the corneal portion of the ligmentatum pectinatum; also, that Descemet's membrane in rabbits' eyes not only continues to the iritic angle, but in one specimen is continuous with the choroid, having broken away from its corneal union for some distance, thus showing its continuity and intimate connection with the choroid coat. This continuance of the membrane may explain why the injected fluid failed to flow from the cut ends of the episcleral veins, as it is stated it does from warm sheep's eyes during these experiments, and give the reason for the freer passage of the fluid into the iris than into the region of Fontana's spaces.

I have tabulated seventeen eyes operated upon according to the method advocated in this paper. These cases were not selected, but were taken consecutively, and I think are about as they usually appear in ophthalmic practice; some of the cases certainly were very unpromising. Time will not permit going into these cases in detail, although it would be interesting and instructive to do so, consequently I have tabulated only the essential features.

Case.	Name.	Age.	Date of Operation.	Vision before Operation.	Vision after Operation.	Tension.	Eye.	Disc.	Duration.
1	Mrs. N. K. H.	56	Nov. 26, '93	20 | 70	20 | 30	+3	R.	Cupped.	Acute for nine days, several mild attacks for over a year.
2	Mrs. E. F. T.	60	Mar. 8, '95	Both eyes. Motion of hand.	R. Cataract L=20 | 50+3.	+3. Both. Chemosis–	Both.	"	Acute 17 days. Both eyes.
3	Mr. S. H.	77	Sept. 20, '95	Perception of Light.	Fingers at 3′	+3 Chemosis+	L.	"	Acute three weeks.
4	Mrs. C. T. A.	57	Nov. 19, '95	R.=20 | 50 L.=20 | 50	=20 | 30 =20 | 40	+3 } +3 } +3	Both.	"	Acute for 14 days.
5	Mrs. J. H. R.	50	Dec. 13, '95	L. Motion of hand.	=20 | 70	+2	L.	"	Acute for 12 days.
6	Mrs. M. E. C.	75	Mar. 26, '96	R.=20 | 100	=6 | 200	+2	R.	"	Recurring attacks for months.
7	Mrs. C. H.	70	May 5, '97	R. Perception of light. L. Perception of light.	Same. Same.	+3 +3 Chemosis–	Both		Acute for six weeks. Both eyes.
8	Mr. C. H. W.	60	July 10, '98	Nil.	Eneucleated 14 days later.	+3 Chemosis.	L.		Acute for three months.
9	Miss M. E. K.	65	Dec. 13, '98	R.=20 | 50 L.=20 | 200 eccentric.	=20 | 30 =Motion of hand.	+2	Both.	"	R. E. halo since Aug. last. Acute 8 days. L. E. with poor vision. Acute 8 days.
10	Mr. H. E. L.	60	Feb. 27, 1900	R. Fingers 3′	=20 | 30	+3 Chemosis–	R.	Slight.	Acute 7 days. Halo around light seen for over a year, after taking hot bath, followed by a cold shower, with some dimness of vision for that day.
11	Mrs. M. M. S.	42	Nov. 20, 1900	R. Not taken.	=20 | 40	+3	R.	No	Acute for two days after needling capsule. Cataract extraction 3½ years previous, June 27, '97.
12	Mrs. S. K. L.	67	Feb. 27, '01	R.=Movement of hand.	=Nil.	+3	R.		Acute two days, 8 weeks after needling capsule. Cataract extraction Nov. 22, '96, 4 years previous.
13	Miss M. L. G.	42	July 12, '01	R.=20 | 70	=20 | 30	+2	R.	Cupped.	Sub-acute six months.

I will not take time to read the table, but will give a resume.

Two eyes were lost by return of tension; one was secondary to a needling of the capsule; extraction 4 years previous.

One developed a cataract.

Two with no perception remained same.

One with perception counted fingers at 3′.

One with vision of $^{20}/_{100}$ loss to $^{6}/_{100}$.

One improved from motion of hand to $^{20}/_{50} + 3$.

One improved from motion of hand to $^{20}/_{40}$.

Three improved from $^{20}/_{50}$ to $^{20}/_{30}$.

One improved from $^{20}/_{50}$ to $^{20}/_{40}$.

One improved from $^{20}/_{70}$ to $^{20}/_{30}$.

One improved from counting fingers at 3′ to $^{20}/_{30}$.

One vision not taken, followed needling of capsule, to $^{20}/_{40}$.

In conclusion, I wish to urge you all to be on the alert to obtain eyes that have been successfully iridectomized for glaucoma, for it is from eyes of this kind that we will be enabled experimentally to trace the exact line of drainage after successful iridectomies, which knowledge will be of great value, and tend to bring about a more definite line of treatment in all forms of glaucoma.

DISCUSSION.

Royal S. Copeland, M. D.: Whether we accept his views or not, I am sure we are indebted to Dr. Suffa for his excellent essay. It attempts more than the relation of an experience. I have thought sometimes that, while most of our papers deal with practical things, they frequently show a lack of that truly scientific and painstaking investigation so essential to make them of permanent value to the profession. It is one thing to present the experiences of the operating room and the manual technique in any given case. It is quite another, however, to put forth a theory accounting for the origin or the processes of a diseased condition and to successfully sustain the arguments for its truth. When that is done the sum total of medical knowledge has been increased and the practice of our profession given a lift to another round of the ladder leading from art to science.

For my part I frankly confess many procedures, which are purely empirical, and which, if I were required to explain, would have to be accounted for as belonging to the art of meeting conditions. To be honest with myself there is anything but a scientific basis for many methods advanced by every authority and recognized as classical.

Probably no other condition met by the ophthalmologist has received half the attention devoted to glaucoma. To account for its origin and its symptoms, theories without number have been advanced, most of them hardly worthy of serious consideration. Others, among which

I would include Dr. Suffa's, deserve thought and investigation. This paper advances an idea which cannot be lightly dealt with or easily disproven.

To be perfectly frank, I do not accept the views of its author. I have not at present command the pathological material to sustain the objections, which, to my mind, make Dr. Suffa's position untenable. Taking into consideration the ordinary means of repair in other tissues of the body, and such evidence as is at hand relating to the repair of damaged irides, it is my belief that the lymph spaces opened by an iridectomy would become closed by the cicatrix or cell proliferation of the healing process. If they are so closed, as analogy leads me to believe, certainly the healed edges of the coloboma would be less permeable to the aqueous than the border of the normal pupil or the surfaces of the iris.

During the period, even immediately following the operation, I am inclined to believe the exudate incidental to the injured iris would compensate for any drainage which might take place through the opened lymph spaces. However, it is possible Dr. Suffa is right on this point.

Tuckermann's investigations and his conclusions as to the non-absorption of the aqueous through the iris have been generally accepted by physiologists. With the doubt, therefore, of the possibility of drainage into Schlemm's canal by way of the iris, and the strong probability that the lymph spaces are closed in the healing process, I must be given some more direct testimony than a "stretch of the imagination," spoken of by the author, to be convinced of the truth of his theory.

The point he makes regarding the common embryonic origin of the parts forming the angle of the anterior chamber might be used, with perfect scientific propriety, to show the possibility of increase in the secretory function, and, *a priori,* an increase of tension from opening the lymph spaces of the iris. This, of course, in the light of our present knowledge concerning the origin of the aqueous, is purely speculative.

In the operation itself I have imitated Collins, whom the author quotes, by making, immediately before the iridectomy, a posterior scleral puncture. Upon the escape of a small amount of vitreous the lens and the iris drop back into a position more nearly normal. The iridectomy is then performed much more easily, whether with the keratome or the Graefe knife.

While I admit the force of Dr. Suffa's arguments in favor of the sclero-corneal incision, yet with the uncertainty of the exact point of drainage his method obviates the possibility of continuous escape of the aqueous through a cystoid cicatrix, a consummation regarded as invaluable by many writers. But, granting the truth of his conclusions relative to drainage through the opened lymph spaces of the iris, Dr. Suffa's method of operation is undoubtedly correct.

John H. Payne, M. D.: Dr. Suffa's paper seems to me very interesting, not only in his experiments by the aniline injections, but also by reason of his ingenious theories as to the line of incision. The former

seem to have but a negative value pathologically, as I believe he suggests in his description of them, by reason of his inability to push them to a satisfactory conclusion. As to the line of incision, and the iridectomy following it, the whole subject seems to simmer down to a question of the value of an excision of a portion of the iris in any case, and just as to the best point to be selected for the initial incision, as the doctor's paper acknowledges this to be of paramount importance. Should the incision be from 6 to 8 mm. in length, or one-fifth the circumference of the cornea, and should the excised iris segment be correspondingly large, as the doctor has asserted? In other words, is there no other way to effect beneficial results without this mutilation and without the dangers that necessarily arise from a gaping wound and its consequent liability to infection and extensive cicatricial contraction?

I think that Dr. Galezowski has answered that question several years ago, when he introduced his method of "Multiple Sclerotomy," so called, which has proved of inestimable value to those who have applied it faithfully. Having a limitless field for experimentation, he began to treat his patients with incisions well without the cornea, in the sclerotic, at varying distances from the sclero-corneal border, and by a comparison of results at length finally decided on 4 mm. from the sclero-corneal border in the sclerotic as the best.

I have not yet heard that he has changed this. The instrument used was a spear-shaped knife, curved on the flat, sharp at both edges, with its greatest width of blade from 3 to 4 mm.

This was thrust into the eye at 4 meridional points around the cornea, the initial puncture being at 4 mm. from the sclero-corneal edge, as I have before stated in each instance, and the blade pushed forward at such an angle as to enter the anterior chamber of the eye as close to the iris angle as possible until the outer incision was equal to the maximum width of the blade, after which it was gently withdrawn. This being repeated four times at different places, resulted in four incisions, each 4 mm. wide. This was done without perceptible loss of aqueous and without interference with the integrity of the iris. Dr. G. felt that the selection of this form of incision insured four punctures of the drainage canals of the eye, especially the spaces of Fontana and the canal of Schlemm. He also felt that by distribution of his incisions he might insure a permanent opening of the canals at some, if not all, of these points, much more definitely than to rely on one incision, however large, with its liability to cicatricial contraction and closure.

He also believed that it had the very great advantage of allowing frequent repetition in case of failure of previous attempts, a thing that is obviously impossible in the case of excision of a large segment of the iris. I know that Dr. G.'s method is not only good in theory, but is also good in practice, if a long series of successful cases conducted by him, and also by myself, is any proof.

At the meeting of the society in Washington three years ago I had the pleasure of calling your attention to this method by a description of it, and by citation of a series of cases, mostly of the sub-acute and simplex variety, and I can say that my subsequent experience has mere-

ly confirmed everything good that was then said about it. I notice that Dr. Suffa has said in his thesis "Furthermore a swollen ciliary body, with possible waves of tension pressing outward in the region of the incision, would have a greater tendency to cause a gaping, or bulging, wound in an oblique incision than one made nearer at right angles to the corneal curve." My experience has coincided with his in respect to the bulging in the old method of operating, but it has been ascribed by me to the large size of the incision rather than to the angle of it, as the smaller incision of Galezowski is made at even a more oblique angle and is absolutely free from any tendency to this bulging.

A reference to the book that the doctor has cited, "System of Diseases of the Eye, Vol. III., pages 631 and 632," reveals this paragraph: "Moreover, in a considerable number of eyes blinded by glaucoma the permeability of the filtration-angle has been tested by injection of the fluid into the anterior chamber, and in every instance a great impairment of filtration has been found." The necessity for a correction of this filtration defect being thus apparent, the question arises, why attack it by a method that leaves principally a mutilation and a dangerous scar that may eventuate in an unsightly bulging, when a milder and safer method without these defects is offered?

J. H. Buffum, M. D.: Dr. Suffa in his paper presents an interesting point for discussion, one that should bring out a full expression of individual observation and experience. Since Von Graefe gave to the world the discovery of the applicability of iridectomy for the relief of certain glaucomatous conditions the concensus of opinion is that the immediate cause of the glaucoma is the obstruction in the path of the exits for the intra-ocular fluid and that comonly he location of the obstruction is in Fontana's spaces. Where a permanent reduction of the tension has followed iridectomy it has been observed that iridectomy had been well-performed and a large portion of the iris excised. The substitution of the operations of cyclotomy, multiple sclerotomy, stretching of the nasal branch of the ophthalmic division of the fifth nerve and excision of the cervical sympathetic are all of exceedingly doubtful value and should not be depended upon where there is a reasonable chance of saving vision by the well-tried operation of iridectomy. It appears reasonable that the danger to sight and future condition of the eyeball is much greater where the increased tension is due to obstruction of the exit channels and consequent retention than from hyper-secretion. I do not think that an unvarying rule can be followed in regard to the exact location, extent and direction of the incision or of the shape of the knife used in making an iridectomy for glaucoma. Experience and judgment obtained in operations of former cases must be the guide. In my own experience the preference is for a scleral incision made about one millimeter beyond the margin of the cornea in an upward direction. A narrow cataract knife is usually preferable and has the advantage over the lance-shaped knife of greater operative ease in a shallow anterior chamber, and also enabling one to make a longer incision and consequently the excision of a larger portion of the iris. The puncture having been made, the appearance of the point

of the knife in the anterior chamber enables one to determine upon the length of the incision practicable, which will vary from six to nine millimeters externally, according to the depth of the anterior chamber and the size of the cornea; the counter puncture is made accordingly and the sclera slowly divided, while the knife is held in a plane with the iris until approaching the narrowing bridge of sclera the knife is turned sufficiently forward to cut the conjunctiva. The incision made, the iris is drawn with forceps well to the temporal side of the incision, a radical cut made and then traction carefully, so as to tear the iris thoroughly from its attachment. Reaching the opposite end of the incision the iris is drawn forward and away from the angle of the incision, and cut off with the scissors, so as to leave the wound clear. The objection to the location of the incision in the lower segment of the cornea is that the danger of the operation is increased, but certain conditions make it advisable.

I recall one case where, because of the adhesions left by a former iritis, it was necessary to make the iridectomy at the nasal side with immediate relief of all symptoms, and for some months when a recurrence of the glaucomatous condition occurred, which required the removal of the eyeball. A microscopical examination in this case would undoubtedly have been of very great interest, but unfortunately the enucleated globe mysteriously disappeared while being passed around in a crowded amphitheatre.

J. Miller Hinson, M. D.: About five years ago I became very skeptical in regard to the benefit to be derived from the size of the cut in the iris. I have seen cases improve with a large iridectomy and others improve with a small iridectomy, in which there was no appreciable loss of iris at all, and in all three of this class of cases the tension was reduced. I am quite satisfied that the amount of iris removed has nothing to do with the result.

G. A. Suffa, M. D.: I thank the discussors for the kind way in which they have treated a debatable question like this.

I am sorry that Dr. Payne is not present, as I desire information on certain details of multiple sclerotomy and what per cent. of cures result and how the results compare with iridectomy in similar cases.

Multiple sclerotomy appeals to me in well advanced chronic cases, where there is obliteration of the iritic angle with a degenerated iris and where it would be difficult to remove an iris segment well to the base of the iris. Puncture, as made in multiple sclerotomy, is necessarily very oblique in direction and would be apt to penetrate the iris at the obliterated angle and enter the anterior chamber, coming through the iris into the anterior chamber beyond the obliterated angle, thus producing a double puncture of the iris and a condition at the base of the iris, as in iridectomy, minus the removal of the segment of iris. In answer to Dr. Payne's statement that there would be less bulging from multiple sclerotomy than from an iridectomy (made well within the sclera with a keratome) I fully agree, but there certainly would be freer drainage in iridectomy, however, done while the wound remained open. An essential in my opinion after operative work for glaucoma.

DRUGS OF VALUE IN THE TREATMENT OF NEURALGIAS OF THE FIFTH NERVE.

BY J. B. GREGG CUSTIS, M. D.,

Washington, D. C.

IT gives me great pleasure to recognize all through the profession, and especially in this organization, a desire to revive an interest in homœopathic therapeutics, and, because of this evident desire, it seems well to preface the few indications that I will offer at this time by calling your attention to the words of wisdom offered by the founder of our school. A paragraph which will appeal especially to this organization made up almost entirely of specialists in diseases of the eye, ear and throat, many of whom have, in the great development which they have made in surgery, pathology and the knowledge which they have added to the physiology of the organs in which they are interested, had too little time to pay attention to the influence of the dynamic power of drugs to change, not only the physiological phenomena, but the pathological conditions which affect the organs in which they are specially interested. I quote paragraph 7, of the Organon: "As in a disease where no manifest or exciting cause presents itself for removal (*causa occasionalis*), we can perceive nothing but the symptoms, then must these symptoms alone (with due attention to the accessory circumstances, and the possibility of the existence of a miasm) guide the physician in the choice of a fit remedy to combat the disease. The totality of the symptoms, this image of the immediate essence of the malady reflected externally, ought to be the principal or sole object by which the latter could make known the medicines it stands in need of—the only agent to determine the choice of a remedy that would be most appropriate. In short, the ensemble of the symptoms is the principal and sole object that a physician ought to have in view in every case of disease—the power of his art is to be directed against that alone, in order to cure and transform it into health."

Before calling your atention to foot-note 1, I must emphasize the parenthesis of Hahnemann which calls attention to the possibility of the existence of a miasm, and warning you against being misled by that unfortunate term which was pardonable in Hahnemann's time, that syphilis

and gonorrhœa are the underlying cause of very many of the chronic diseases which we are called upon to treat, and that when those diseases have been suppressed by mercury, nitrate of silver, or what not, the recognition of their prior existence is absolutely necessary for the rational treatment of the symptoms presented by the patient.

But to return to the Organon, in the foot-note No. 1 we find the following (I am quoting from the fourth American edition): "It is taken for granted that every intelligent physician will commence by removing this *causa occasionalis;* then the indisposition usually yields of itself. Thus, it is necessary to remove flowers from the room when their odors occasion paroxysms of fainting and hysteria; extract from the eye the foreign substance which occasions ophthalmia; remove the tight bandages from a wounded limb which threatens gangrene, and apply others more suitable; lay bare and tie up a wounded artery where hæmorrhage produces fainting; evacuate the berries of Belladonna, etc., which may have been swallowed, by vomiting; extract the foreign particles which have introduced themselves into the openings of the body (the nose, pharynx, ears, urethra, rectum, vagina); grind down a stone in the bladder; open the imperforate anus of the new-born infant," etc. You will see by this foot-note that Hering justifies the general practitioner in calling upon you for your assistance, because skill in these matters require practice which it is impossible for him to have. By reason of this doctrine we are glad for your respectful hearing, and are pleased to be called in to assist in those cases which apply to you first. To go farther into the study of the Organon, we will repeat, without quoting the shibboleth of the homœopath, that the disease represents the totality of the symptoms, and remind you that in a large majority of the cases the symptoms that lead a patient to call upon any physician for his services are those of pain, and note, by the way, that pain, because of the fact that it is the first warning that a large majority of diseases give, is a wise provision of nature, and that it should be used not only as a warning to the patient but as a guide to the physician in search of remedies, and that the alleviation of suffering, at least until after full recognition of its cause, and as nearly as possible the feeling of certainty that its removal will remove all conditions resulting, or until certainty as to the remedy the administration of which, because of its dynamic powers, will meet the dynamic influences that work in the system, should not be considered excepting when the pain and suffering caused can be relieved by the therapeutic remedy or the removal of the *causa occasionalis.*

We have already called attention to Hahnemann's remark that the *causa occasionalis* once being removed the disease will cure itself. When we are sure that we have removed that cause the local treatment with which you are all familiar is justifiable. When you are not able with certainty to remove the cause, or are not absolutely sure that the pain complained of is reflex, and that the same has been recognized by yourself or your consultant, who is more familiar with the offending part, it is not justifiable to benumb the sensibilities while the disease goes on to the possible destruction of the function of the nerve which has kindly given its warning. More than this. With the knowledge that is possible of the homœopathic remedies, there is less excuse for the homœopathic specialist to resort to narcotics or anodynes than for any other class of practitioners.

As the fifth nerve with its various branches affects more of the surface in which you are interested than any other, your president or secretary asked me to speak of the remedies useful in its neuralgias. I will not confine myself to that term, neither will I exhaust the subject, and want here to give credit to Drs. Marvin A. Custis and A. H. Taylor for the collection of most of the symptoms which will form the body of this paper. If a continuation is desired, speaking for them as well as myself, we will carry the subject as far as our literature and personal experience will allow.

I will not take up your time in describing the fifth nerve either as to its origin or distribution, but cannot refrain from recalling the great number of ganglia which it possesses. Because of the possession of these ganglia I believe it is the greatest nerve in the body as an indicator for remedies in the treatment of disease. That more reflex symptoms are shown along its distribution, that greater suffering is caused by mechanical, pathological and functional disturbances along its course I am sure. The existence of the ganglia explains these facts, and it is because each one of the ganglia have added to the general distribution of the original nerve, a motor, sensory and sympathetic filament.

The ophthalmic ganglion is the origin of many of the reflexes which result from heterotropia.

The spheno-palatine, or the ganglion of Meckel, is the cause of many cases of the conjunctivitis, which are sympathetic with ovarian and uterine diseases, as well as the nasal symptoms which accompany the menstrual molimen.

The otic ganglion supplies the Eustachian tube and the tensor palatine, muscle. Remarks on its possibilities are unnecessary. When diseases,

which would lead you to think that irritation of this nerve was the cause, present themselves, and they do not yield readily by remedies given under the indications, as under the rubric toothache in "Hering's Domestic Physician," and referred to in "Raue's Therapeutics," you can be sure there is a mechanical cause for the continuance of the pain; that either the nerve sheath is thickened, or there are calcareous deposits along its course, or there is ossification of the nerve itself. Nerves of this ganglia all pass through osseous foramen before termination, consequently they are more liable to pressure than any other nerve in the body, therefore, pain along their course becomes more valuable as indicating remedies than are the pains in almost any other part of the body. A full study of these conditions will require more time than I have been able to give since notification of my appointment on this bureau, but, with the assistance of Drs. Custis and Taylor, I offer the following:

Aconite, when the *causa occasionalis* is exposure to high, cold wind, a sense of pressure, paralysis of the side exposed, and the fact that the patient is driven almost to desperation by the pains which are really severe: they are somewhat relieved by hard pressure and strong rubbing. The Chamomilla patient will refuse to stand the pain, not because of its great severity, but because of his own great irritability, while the Coffea patient is in a great state of excitement and wakefulness. I consider that the exposure to cold wind is the keynote for neuralgia of the fifth nerve when Aconite is called for.

Alum, the keynote of which is dryness of mucous membrane, affects the first branch, and causes spasmodic conditions and twitching. The acompanying symptoms of this are associated with diseases of the lower bowel, especially hæmorrhoids, and the passing of mucus and blood.

Argentum nitricum, while it affects the infra-orbital branch, need not be thought of unless accompanied by gastric disturbances, as shown by the loud belching of gas from the stomach and the desire for sweet things.

Arsenicum is the right-sided remedy as regards the face. The pains must be hot, the patient must be pale and restless, he is generally thirsty and always prostrated. Without these characteristic symptoms the remedy will disapoint you, but in some of its combinations it will bring about the results which you had expected from the metal alone. The combination which has served me more than any other is Natrum arsenicum. Most of the patients present a dejected picture because of the wasting of the face in the orbital region. They complain of headache, infra-orbital for the most part, have discharge from the nostrils. The pain is

referred to the malar bone and comes in paroxysms; in fact, it is one of the remedies for the right-sided tic douloureux.

Agaricus is possibly one of the most useful remedies that we have. The indications for it are confined particularly to the locality under discussion, and the keynote to the pain is coldness, pains as though a sharp piece of ice touched the head or face, or led you to think of it; a twitching of choreic symptom, almost a constant accompaniment; it affects all the branches of the fifth nerve. Both the pain and muscular twitchings and the illusions of sight and hearing are almost as characteristic as the sense of cold and the intolerance of the odor of vinegar.

I do not need to talk to this body about *Belladonna,* which comes next in my discussion, its accompanying symptoms always being the reason for its use; the throbbing of the pain is the symptom which raises hope as to its result.

Bryonia in our Washington climate, and I suspect in New York, covers many cases of neuralgia of the firth nerve if the physician is applied to within the first twenty-four hours. It is often the remedy that will affect the superior maxillary branch before swelling of the face has occurred, and frequently cuts short inflammatory conditions about the eye; relieves earache and toothache aggravated by the slightest motion.

Baryta carb. has a verified symptom agreed to by both Cowperthwaite and Clarke, which is described as a sensation as if the skin were covered with a cobweb, or as if the white of an egg had dried on it. I cannot imagine that it would help on that symptom alone unless it occurred in a dark complexioned, undersized patient, or had the history of, or present with them, enlarged tonsils.

We have many other indications which have been handed down, for example, *Cedron,* when the pains occur with clock-like periodicity. But whether a case in Massachusetts was ever cured with Cedron on this indication I have my doubts. It is a South American remedy, associated with malaria, and, while it has some peculiar indications for its use which are marked verified in "Hering," I would only recommend its use after careful study of the concomitant symptoms, especially those connected with the sexual sphere.

Calcarea as a foundation will often help in the cure of all conditions indicated by trouble of the fifth nerve, when constitutionally indicated. Remember it has the dilated pupils, and swollen lids until the point of agglutination in the morning, and when you prescribe Calcarea you had better forget all the local symptoms and remember the short-breathed, flabby, foot and hand sweating, scrofulous child.

Causticum when ptosis is present is always first thought of, but remember that Fluoric acid and Stannum have both the same symptoms, and that the Causticum patient must be of the Calcarea variety, and have bladder and other symptoms not necessarily present at the time of the prescription, but in their history, if you expect permanent results to follow its administration.

Colocynth has gained a good reputation for the spasmodic pains of the fifth nerve which are relieved by pressure which is always applied while the head is bent, just as the colic is relieved by pressure and bending the patient. Our old friend, Dr. Helmuth, called attention to this remedy for severe neuralgias of the face, but remember that the bent head and the pressure is the modality which must be present.

Capsicum when pain is present in petrous portions of the temporal bone, as a concomitant of pain in the face. The Capsicum patient has intolerance of the slightest draft of air on the affected part. Do not confound this with the Hepar patient who wants the whole body wrapped in blankets; or, if he is German, uses the feather bed as a cover. You can fan the foot of the Capsicum patient who is only intolerant when the draft touches the course of the offending nerve.

Many of you will find friends who require *Gelsemium.* You will find among them those whose pains drive them to drink, as its pains, and especially those of the fifth nerve, are temporarily relieved by stimulants, and in all of these people you will find that the stimulants act promptly on the kidneys, but there is a hypersecretion which temporarily affords relief to the neuralgias complained of.

I offer this paper largely as a sample as to how we think Materia Medica might be taught to become interesting, and cannot cover the whole list of remedies.

Before closing, I call your attention to the fact that Ignatia relieves the pain of the fifth nerve when it is similar to the nail driven in the head, but only when the *causa occasionalis* is grief, or a general hysterical condition. Kali bich. being a more frequently called for remedy when the pain can be covered by the touch of the finger, especially if it is along the supraorbital ridge or supraorbital notch.

You, gentlemen, who have found your friends among the Gelsemium patients must not forget the Nux vomica contingent, who have the supraorbital pain in the morning accompanied by the dark brown taste and the history of the night before, which will not bear repetition.

With the promise of more at succeeding sessions I offer this for your discussion.

DISCUSSION.

C. H. Hubbard, M. D.: In regard to Gelsemium, my principal indication for its use, not only in affections of the fifth nerve, but also generally, is the sleepiness and drowsiness of the patient. Drooping and heaviness of the lids is a good indication for its use. The patient will say that he or she cannot keep awake, their lids are so heavy. I made an involuntary proving of Gelsemium upon myself, and am well acquainted with the feeling and the symptom. When you get this indication for it Gelsemium will give you good results.

J. B. G. Custis, M. D.: I did not speak, as I might have done, of Nux moschata. Great sleepiness always brings that drug to my mind more than any other. There is also dry mouth, dry tongue, and a tendency to faint. Such patients want water by them all night so that they can wet their parched mouth.

INDICATIONS FOR ELECTRICITY IN DISEASES OF THE EYE.

BY WILLIAM RUFUS KING, M. D.,

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A COMPLETE consideration of this topic would obviously require so much space and time that it would be impractical to prepare such a paper to be read and discussed at a meeting of this society, where so many practical and excellent papers are presented, in the limited time at our disposal. It will, therefore, be my effort to but casually mention many of the diseases of the eye wherein electricity has proved valuable as an agent for treatment, and to only take up fully a few of the more important ones and invite discussions thereon.

While great strides have been made in the past few years along all lines of electro-therapeutics, much remains to be learned, and a complete classification of its field of usefulness remains yet in the future.

In the recent work on "Electricity in Medicine and Surgery," by Dr. William Harvey King, no mention is made of the application of electricity to diseases of the eye. Very little along this line has appeared in the journals from the pens of workers in the special line of ophthalmology, hence much that appears herein must emanate from the author's personal experience, and may not at present be verified by the work of others, at least not in all details and particulars.

In diseases of the eyelids little need be said along the line of treatment by means of electricity. In ptosis of non-paralytic nature benefit has not infrequently been derived by the use of the interrupted galvanic current, or in some instances the faradic current, or both in alternation; the positive pole at the post-cervical or occipital region and the negative pole directly over the insufficient levator palpebra muscle. Blepharospasm has yielded at times to the soothing galvanic current. My experience indicates that exanthemata of the palpebral cuticle can be best and most permanently relieved by means of the galvano-cautery knife. Large chalazia have been decreased in size and small ones entirely removed by the direct applications of the galvanic current with frequent

sittings. Cataphoresis has been successfully applied for the removal of these tarsal cysts.

I have had little experience along this line, as I prefer the more rapid method of removal by direct surgical procedure. Occasionally this method is declined by the patient, and in a few such instances I have more or less sucessfully used the slower and more uncertain method now under consideration.

In affections of the lachrymal apparatus I have had some success in one case of hypertrophy of the lachrymal gland. The enlargement was not entirely overcome, but it was decidedly reduced by the application of the constant current. Occasionally it may be found necessary to utilize the galvano-cautery to freshen up and stimulate the track of a lachrymal fistula.

In diseases of the orbital cavity I have had no experience in the use of electricity as a therapeutic agent, though I believe it might be of service to aid in removing the extravasation remaining after a case of orbital cellulitis.

In affections of the ocular muscles I have found electricity to play a highly important part. In fact, I would scarcely know how to get along without it in many cases of insufficiency and inco-ordination. This particularly applies to those cases wherein there is scarcely enough deviation to demand operative measures, yet producing marked reflex symptoms and much discomfort. It is also useful in the case of those sufferers, who, through fear and aversion to the knife, decline surgical relief. Here it frequently is not possible to effect a radical cure of the heterophoria, but much relief of the distressing symptoms usually follows the proper use of electricity, especially when associated with the more recent methods of direct muscle massage.

I have for years utilized electricity in various ways in treating cases where the conditions presenting are due to inco-ordination or insufficiency of the extraneous ocular muscles.

It has been my practice to employ most commonly the interrupted galvanic current, occasionally substituting or following with a brief application of the faradic current. The positive pole is placed over the post-cervical sympathetic ganglion of the side to be treated, the negative pole by means of a flat metal plate covered by wet absorbent cotton is placed directly over the tendon of the muscle to be treated, and the current applied through the closed lids. I have never observed sufficient advantage gained by using this method of treatment direct to the conjunctival surface to make up for the discomfort which the latter

method gives the patient, even with the utilization of local anæsthesia. My rule has been to apply from two to six milliamperes of the alternating current, and to continue the application for from three to ten minutes. I have never used in these cases the high frequency current, though I am informed by some of my colleagues that in cases of muscular asthenopia the patients experience great relief of pain and the strained feeling resulting from overwork. I have never had a report as to any specific gain in muscular power or relief of inco-ordination from this form of electricity, but I have much confidence that it should prove very beneficial if scientifically and properly used.

Of course my application of electricity in these cases is not the only treatment used. I usually employ prism gymnastics, local tonic, remedies, and, strange to say, not infrequently, the selected homœopathic remedy. I believe I obtain some beneficial results from each of these various methods, but I would be very loath to give up the electricity, which I deem one of the most prompt and efficacious local tonics at our hands.

Latterly, I have experimented considerably with the application of the so-called pneumatic muscle massage, both alone and in conjunction with the older methods. This I apply by means of small glass applicators connected by means of rubber tubing to a Wappler pump, or more recently to the Hasbrouck rhythmo-pneumatic masseur. The latter apparatus permits of more delicate and often more efficient manipulation than the Wappler machine, and by reason of the ingenious control valves and the steam guage in circuit, one can observe and control to a nicety the exact amount of pressure or suction or of alternate pressure and suction in each given case. The latter instrument is too new to be capable of much exploiting in actual work done with it, but I anticipate good things from it.

One of the main advantages that has so far attracted my attention is the fact that with the latter instrument we can work directly on the muscle, through the ocular conjunctiva, massaging it under our direct vision, and with it we can demonstrate the exact amount of muscle fibre present in any given muscle, and exactly locate the same. Excepting for the fact that electricity is the motive power for these machines, the consideration in detail of their application to eye diseases does not properly belong in this paper.

In diseases of the conjunctiva I have had no experience with electricity, and can scarcely conceive of any field for it in this class of ocular affections.

In diseases of the cornea I have had some occasional apparent success, as, for instance, in recent macula cornea. Following the application of a solution of nitrate of mercury, a salve of yellow oxide of mercury, or an insufflation of Calomel, it has been my habit to apply over the eye and through the lids a constant current of galvanism of from one to five milliamperes. I am convinced that it facilitates the action of the local medicament. Latterly, I think I have undoubtedly improved these results by the addition of local pneumatic massage direct to the cornea. In stubborn, creeping ulcers of the cornea showing no disposition to heal or even desist and subside, I, of course, have sought the service of the galvano-cautery, and in most instances, with very happy results, so far at least, as to promptly institute reparative change.

In diseases of the sclera, iris and ciliary body, I have had no experience with electricity, and at present can conceive of no field for it in these affections.

In diseases of the choroid and more especially for the result of such diseases, I have utilized this method of treatment a little. I think in several instances, especially in choroiditis diffusa, I have seen the progress of the disease promptly cease under its application, and in several cases quite a little improvement in vision has followed its steady, persistent use. This improvement was not only manifest from the patient's improvement in visual power, but the ophthalmoscope revealed decided changes for the better in the appearance of the choroid. Of course, the cases showing benefit have invariably been active or recent cases.

In one case of choroiditis syphilitica that is still under my occasional observation, the patient was treated solely by means of the strictest homœopathic methods by his family physician, who is a friend and colleague, and to whose case book I have access. The man has made an excellent recovery in every way with the exception of one eye, in which choroiditis has left all the marks of its fell ravages. The eye was practically useless when he was referred to me. His other eye was not affected until a month or two later, when all the dread symptoms made their appearance, and the ophthalmoscope confirmed the diagnosis. He received exactly the same medicinal treatment at this time as before, but the constant galvanic current was applied two or three times a week to the eye in the usual manner, with an early subsidence of the active symptoms, matters coming to a standstill for a while, and, later on, improvement both of vision and in the appearance of the parts manifested itself, and now vision equals five-sixths readily, and he conducts an active business most satisfactorily. The other eye has also improved

slowly under the active galvanization, but the vision only amounts to four forty-fifths with difficulty, and on the temporal side of the field alone. He has no practical reading or close vision with this eye. Now the only difference in the treatment of this fellow's eyes was the use of galvanism early in the eye which was last to be effected, and not until late in the one primarily diseased. It is fair to presume, I suppose, that galvanism had some part in the good results obtained upon eye number two.

In diseases of the retina I have utilized electricity quite extensively for the past fifteen or sixteen years.

In retinitis pigmentosa I believe it has materially assisted the homœopathic remedies in not only retarding the degenerative changes, but has been a potent means of improving the vision to some extent. In the case of two patients whom I have been able to watch for the past fifteen years, and who I have seen grow from childhood to young man and womanhood, not only retaining but gaining in visual ability as well as in the extent of their field of vision as measured once or twice a year by means of the perimeter, I have had them maintain, practically, a daily application of the galvanic current at their home in West Virginia, and, in addition, have through a part of each year maintained a line of therapeutic care by the use of apparently proper homœopathic remedies. The boy (now a man of twenty-eight) can now tell time by his watch in the moonlight, a thing he never remembered that he was able to do before this treatemnt was instituted. Some years ago he sent me a large wild turkey, which had fallen a witness to his gun prowess. The history of this disease does not point to many cases of even partial improvement, and I am sure that the care of watchful and intelligent parents, together with the constant and intelligent application of electricity, has done much to maintain these individuals as useful members of the community.

In detachment of the retina I have more than once felt convinced that the careful but persistent use of the galvanic current has aided and expedited the absorption of the sub-retinal extravasation. This, like many other such convictions, is very hard to demonstrate or to prove, and perhaps something must be allowed in the line of enthusiasm for one who works in and believes in the general efficiency of electricity, carefully and scientifically applied.

In cases of hæmorrhage into the retina I invariably use the galvanic current in conjunction with other appropriate treatment to aid in promoting absorption of the clot, and I am convinced by my experience that

it has expedited such absorption and hastened the amount of recovery that has been acquired in each case.

In optic nerve diseases, especially in hæmorrahge of the nerve, retrobulbar neuritis, and in the early stages of optic neuritis, I am equally convinced that the use of the constant galvanic current has aided me in either improving the condition or in retarding the progress of the unimprovable cases quite a little. It would be ridiculous for me to claim any benefit from its use in advanced cases of optic nerve atrophy. It will no more restore the nerve to life and functional activity than it will restore life itself in the moribund.

I have several times used this treatment upon one eye that was in the early stage of involvment when the other eye had been rendered totally blind, and have by this means retarded and held stationary the disease so that for years the patient has retained useful vision when the other eye had been rapidly lost in the absence of such treatment. I have at present under observation such a case, a man about 63 years of age who presented himself to me about two years ago. The right eye was useless and retained only vision for very large objects, and then only over a part of the field. The other eye was beginning to be involved, vision was becoming hazy, the disk pallid, and all the general early symptoms presenting themselves. He has been under steady active treatment, at first only with the constant galvanic current and remedies as they seemed indicated, but latterly with the addition of pneumatic massage. Never has the electricity been suspended. The objective symptoms have remained stationary, and the vision lost its hazy character. Vision is now five-sixths with some hesitation, and no change has occurred in over a year. The other eye has received no treatment and had progressed rapidly, and its condition was only discovered when he applied for a change of lenses for reading. Needless to say no benefit was derived from the treatment, which was also applied to the eye which was advanced in the disease. Vision in this eye is now absolutely nil, and the disk quite dead and ashy white.

In amblyopia or amaurosis I have had but little experience, though I used it, as I thought, quite successfully in a case of amblyopia from loss of blood or exsanguinated. Inasmuch as other active treatment to restore the quantity and quality of blood was utilized in this case, I am not prepared to say how much the electricity may have benefited the ocular circulation. We know that it does stimulate the flow of blood in parts whereon it is applied, but its use alone in such a case would be necessary to assure us of its unquestioned value.

In diseases of the vitreous the only experience I have had has been where there existed floating opacities or in hæmorrhage into the vitreous. Here it was used for the same reason as in hæmorrhage of the retina, viz,, to expedite absorption of the hæmorrhagic products.

In incipient cataract I have for many years used it in conjunction with the selected homœopathic remedy and other appropriate local treatment in my efforts to rejuvenate and revitalize the tissues of the crystalline lens. That it has been a really necessary part of the treatment I cannot say, for some cases have done well who were treated away from my office, and so situated that they could not have an intelligent application of electricity made. It is my opinion, however, in comparing these cases with the ones who have received more or less regular application of the galvanic current that the latter class of cases progress more rapidly as well as more completely toward restoration or retention of useful vision.

The laity, and I fear some of the profession, still speak of this treatment as that of *absorption* of cataract. This, of course, is ridiculous as well as unscientific. I invariably disclaim any ability to absorb cataracts, but agree that in many cases much can be done to restore the impaired vitality of the crystalline lens, or at least to prevent or retard advancing impairment. The suggestion made by a colleague in an article in a recent number of one of our journals, that we speak of the results of this treatment as a "revitalization of the structures of the crystalline lens," meets with my approval and endorsement.

I am at present experimenting with the use of pneumatic massage directly over the cornea in these cases. I believe I am improving the results, but am not yet prepared to say definitely. At a later meeting of this society I hope to be able to go more fully into this matter of local eye massage as an adjuvant in the treatment of many intra-ocular diseases. It is perhaps sufficient to say that I have not yet had the courage to use it in the more important cases except as an adjunct to the application of electricity.

In glaucoma, even in the chronic variety, I have never been able to see indications for its use, and would fear some detriment might ensue from its use, hence I have nothing to offer along this line.

I must confess that I have never used the more modern forms of electricity, such as the Roentgen ray, the Finsen ray or the high frequency current. I should be a little fearful of applying either of the first two mentioned rays to the human eye, and doubt whether sufficient could be gained by such a line of experiment to warrant the risk to the eye. Of course, I would not hesitate to use the X-ray in an attempt to

locate a foreign body in the interior of the eye or the orbit, as little additional damage would be likely to be done to the organ.

As I have already mentioned, I believe the high frequency current will prove of distinct value, especially in cases of muscular asthenopia, acting as a direct tonic and being quite painless when properly applied. It is my attention to take up the use of this current and to utilize it in my practice when the opportunity presents itself.

I shall be most happy if this paper draws out an interesting and instructive discussion, and I should especially like to hear from those who are using electricity daily in their practice, and more especially from those using other methods of application than those of which I have spoken, or those using similar methods in a different and perhaps more practical and scientific manner.

DISCUSSION.

David W. Wells, M. D.: Therapeutics has not yet risen to the dignity of a science, yet I am heartily in sympathy with Dr. King's plea for the scientific application of electricity. To this end one needs first to understand the elementary principles of electro-physics, and one's practice can justify the adjective "scientific" only when these principles are so applied as to produce definite physical or chemical changes in the tissues treated. Before discussing the subject matter of this paper let us briefly review some of the established facts. Neiswanger (1902) differentiates the polar effects of the galvanic current as follows:

Positive Pole.	*Negative Pole.*
1. Oxygen.	1. Hydrogen.
2. Acid.	2. Alkaline.
3. Will stop bleeding.	3. Increases bleeding.
4. Sedative.	4. Produces hyper-sensitiveness.
5. Hardens tissue.	5. Liquefies and disintegrates.
6. Is an acid caustic and the resulting cicatrix is hard and unyielding.	6. Is an alkaline caustic, and the resulting cicatrix is soft and pliable.
7. Is a vaso-motor constrictor.	7. Is a vaso-dilator.

Ordinarily the constant current stimulates a muscle only at the make and break, therefore for stimulant effects the interrupted galvanic or the faradic, which is a rapidly interrupted current, is more effective. Yet while the constant current causes no visible effect between the make and break, there is wrought a change in the irritability of the muscle which is called its electrotonus. Thus the use of the negative or cathode anode, decreases irritability, anelectrotonus. The essayist specifies

as active pole increases irritability, katelectrotonus, the positive or "non-paralytic ptosis" and "heterophoria and inco-ordination," as conditions indicating electrical stimulation. This is a tacit assumption that paralyzed muscle, either lavator or rectus, is not amenable to this treatment, and this seems to be the prevailing opinion of critical investigators. Savage says: "Not untli the diplopia has disappeared will the interrupted current of electricity used once daily for ten minutes do good." Jackson* says: "Cathode 1 m. a. or mild faradic may be used, sometimes with apparent benefit, but currents must be weak." I have used cathode, both constant and interrupted current, 1 to 2 m. a., on nearly every case of paralyzed rectus which I have treated. In the majority this has been applied directly to the cocainized conjunctival surface through a small cotton covered electrode, but I must confess that I have never been able to satisfy myself of its value. It is true the same may be said of the remedies employed, and yet I continue to use both. It is not practicable to use sufficient current to cause the muscle to contract, and in the light of the elementary principles have we any right to assume that a muscle is stimulated unless it is made to act? Given the condition of non-paralytic ptosis, what can we hope to do? If from trachomatous thickening certainly stimulation is not indicated. If from injury to the nerve endings in the muscle plates nothing but centrifugal regeneration of the axis cylinders can effect a cure. But if the condition be due to an insufficient central nervous impulse, it seems to me that the production of katelectrotonus is a practical possibility. Just how many m. a. are necessary for this I do not know, but I fear it would be unsafe to use a sufficient current strength without holding the lid away from the globe with a rubber spatula, and the application of the positive pole to the integument in the immediate vicinity. Few of us who have experienced the flashes of light from a few milliamperes sent through the head would care to risk the danger to the optic nerve of more than 3 to 4 m. a. Now admitting that all this can be done, what has been accomplished? The muscle has been rendered more irritable for the time being, but has the central nervous impulse been increased? The consideration of the difficulties here involved brings us to the subject of stimulating the weak extrinsic muscles in heterophoria. It is stated that the "negative pole by means of a flat muscle plate covered by wet absorbent cotton is placed directly over the *tendon* of the muscle to be treated, the lids being closed." I have underlined the word tendon because it shows that the author has some doubt about being able to reach the muscle fibres themselves. Have we a right to assume that our negative current has a special affinity for what we consider the weak muscle, so that it will pass inert through the skin, the orbicularis and the capsule of Tennon and establish its polarity in the rectus. What amperage would be necessary to produce such deep effects? Certainly none that would be agreeable

*Jacobi Electro-Therapeutics, Vol. II., System of Physiological Therapeutics, No. Myology, p. 523.

and safe to use. I have no doubt that the doctor's results are admirable, and that "much relief of the distressing symptoms usually follows," but is it possible to demonstrate that the muscle power is greater *after* than *before* the treatment? It seems to me that nothing less than experiments along this line with no adjuvant gymnastic exercises and remedies would warrant the assumption that katelectrotonus had been produced. Moreover, I am not aware that increased irritability during the few minutes of application increases much power. I have occasionally had what at first sight would seem to be a demonstration of this. After stereoscopic training to stimulate the adductors, I use loose prisms, and with 20 to 40 degrees sometimes one eye will diverge, and the patient not recognize it as he suppresses the retinal image. Faradic current applied to this eye alone over the inner canthus will sometimes enable the patient to give better heed to this eye and fuse stronger prisms, but never beyond the amount reached previously with the stereoscopic image as an anchor. The muscle has not been stimulated but the *desire* for fusion has been increased. In partial or complete paralyses of other parts of the body electrical stimulation is used to exercise the affected muscle and prevent atrophy until the normal nervous impulse is re-established *by other means* either natural or medicinal. The doctor speaks of "two to six milliamperes of *alternating* current." I assume this is a misprint, the intention being to say "interrupted," as alternating currents cannot be measured by the meter ordinarily employed in therapeutic work. In applying galvanism to hypertrophy of lachrymal gland I should like to know which pole to use? I should assume it would be the positive to produce vaso-constriction and reduce nutrition. It is also important to know amperage necessary. In the treatment of chalazia the question of polarity again suggests itself, and we need to know by what physical or chemical change galvanism reduces a retention cyst. We know that simple evacuation will not suffice, but that a destruction of the sac membrane is essential for obliteration of the tumor. I should think this might be secured by negative electrolysis, but I have no experience to offer. Cataphoresis is also advocated for "tarsal cysts," but no mention is made of the substance employed. This is like "Hamlet with Hamlet left out." Again, I am in doubt of the author's object in using galvanism after the application of nitrate of mercury, yellow oxide of mercury salve and calomel to the cornea. If cataphoresis is expected we must understand that the medicament is decomposed, and that the resulting simple substances are drawn into the tissue only when they have an affinity for the opposite pole to the one on which they are applied. Otherwise the medicine remains on the electrode. Several other important conditions must be fulfilled. "The substance must be a fluid or semi-fluid; it must be a conductor of electricity, and one of its constituent elements must be a metal or salt of metal." As mercury has an affinity for the negative pole it would need to be applied on the positive. The same is true of cocaine and morphia sulph. On the other hand, potas. iod. to secure cataphoresis of iodine must be applied

on the negative pole, as it has an affinity for the positive. Moreover, it seems to me doubtful if cataphoric action can be secured with any amperage which it is safe to use, except by wetting the electrode in the medicinal solution. Fats and oils are not capable of being electrolized because they are non-conductors. This would of course preclude the use of mercuric ointment. My allotted time will not allow the consideration of deep-seated lesions, choroiditis, retinal hæmorrhage and detachment, vitreous opacities and retinitis pigmentosa. I hope to hear these subjects thoroughly discussed, though I must confess that a candid consideration of the paper has not convinceed me that electricity played any part in the good results obtained. The structural damage which will follow a given lesion and the course of an insidious disease are at present so uncertain that a vast amount of *post-hocs* are necessary to the establishment of the *propter hoc*. In discussing the treatment of cataract either by electricity or remedies, we are on delicate ground. I am grateful to the experimenters who gave us their reports, but I believe with Dr. Harold Wilson, who said last year, in discussing Dr. Bissell's careful account of his methods and results: "Two points of a critical nature arise in my mind. There has been a great deal of literature on this subject, and almost all I have read have begun to investigate the subject at the wrong end and in the wrong way. Before we can come to any scientific conclusion as to the results of treatment, we must have data concerning the natural history, the course, duration, progress, etc., the disease, untouched and unmodified by either external applications or by internal treatment. This has not been done. We are so anxious to treat patients, and patients are so anxious to be treated, that this kind of study is very difficult to do. I have seen cases remain stationary under practically no treatment for eighteen years. The second criticism I want to make is that if we were all to follow the methods of Dr. Bissell we would be no wiser at the end of ten years than we are now. When you multiply methods and means of treatment on a case, you multiply doubt as to the benefit derived from any individual mode. By using massage, steaming, electrical applications, internal medications, dietetics and general hygiene upon the same case, you can never know which of the various means did the work, or how much is attributed to any one, or which are worthless. My plea is for the study of cataract, unmodified by treatment, and, second, for the study of various methods, one at a time. This must be the foundation for a rational understanding of the subject."

I want to congratulate Dr. King on his success in the interesting cases which he had presented and on his candor concerning the difficulty of deciding as to the value of different therapeutic agents. I believe we have not sufficiently recognized the *suggestive* element in relieving symptoms. Instead of depreciating this we should make it a strong ally. It is impossible to divorce from physical agents and remedies the metaphysical element, and, indeed, undesirable so to do except when striving to deduce a physico-therapeutic science. We have no more effective agent of suggestion than electricity, and the kind which makes

the most noise and sparking is undoubtedly the most efficacious. While I think the effect of electricity in heterophoria is largely suggestive, and I suspect the same thing is true in pneumo-muscle massage, far from condemning its use, I am free to confess that I often use both with no other intention. Jackson (l. c.) concludes that electricity is of considerable value in relieving asthenopia, for which no refractive or heteroporic cause can be found. This is to me very "suggestive" of the suggestibility of the conditions. I believe in the scientific use of electricity for which Dr. King pleads, but am forced to admit that I do not yet know enough about inter-polar effects to find a large application in ocular therapeutics. Let us continue experimenting, scientifically if possible, but if it must be empirical, let the data be presented in such fullness, the failure and successes, that some substantial conclusions can be drawn.

Dr. King makes no mention of electrolysis, yet to me this is the one form of electricity besides cautery for which we have exact indications and in which results are demonstrable. The treatment of trichiasis by epilation is, I believe, bad practice, the fine hair being replaced by a stiff one, "begetting the calamitous necessity of keeping on." If a true entropion exists resort must be had to surgical measures, but for the wild misdirected cilia, even though they be rather numerous, electrolysis affords a permanent cure. My method, which is not original, is to attach to the negative pole a fine, sharp steel broach, the patient holding the positive in one hand, making the circuit with palm of the other. Steadying the lid with one hand the broach is introduced exactly beside the hair to the depth of three mm., the field of operation being well illuminated by a condensing lens in the hands of an assistant. The patient is then told to grasp the sponge, and the current is gradually turned on 'till bubbles are seen at the point of puncture. From 1 to 3 m. a. suffices. The current is then turned off and the hair lifted out with the forceps, no force at all being required if the broach has exactly entered the follicle. It is moderately painful, and there follows some reaction, so that it is well not to remove more than five from one lid at one sitting. The punctures should be separated at least five mm. In my hands this method has been invariably successful. I do not doubt that in some cases the hair has grown again. It is frequently difficult to decide if the new hair be from the same follicle or an adjoining one, for it is a nice point to insert the broach exactly in the axis of the follicle, but in the end success is attained. In stricture of the lachrymal canal and duct electrolysis often effects a cure from one treatment. I confess that I do not like an old case that has been probed by a number of different men. I think most of us know by experience that a false passage can easily be made. After stretching the puncture I introduce a number four or five Theobald or Williams probe, previously coated with shellac, except three or four mm. of the tip. When a point is reached where any force is required I connect to the negative pole. The positive, a small silver bulb covered with cotton, saturated with cocaine, is inserted in the nares against the inferior turbinate. This

latter serves the double purpose of anæsthesia by cataphoresis and the shrinkage of the tissue, so that inspection reveals more exactly the point of entrance. The current is then turned on and gradually increased till the stricture is felt to give way with slight pressure on the probe. This should never require more than three m. a. The electrodes are now disconnected, and as before stated, the point of entrance into the nose carefully determined. This should never be omitted. Some days should elapse before a second treatment. I have had some very brilliant results and some failures. Nearly all the cases have been old ones, and for these I am not enthusiastic about any method of treatment. I tried Dr. Mial's insulated probes, but they lacked durability, the rubber being brittle. The action of the negative pole applied with small electrode to mucous surface is that of an alkaline caustic which softens and liquefies the tissue, in which state it is more absorbable by the lymphatics. My cases have experienced little or no pain. It seems to me that cupric electrolysis offers some advantages in these cases. This requires a copper probe as positive electrode, the oxide of the metal combining with hydrochloric acid set free from the sodium chloride of the tissue, forming an oxy chloride of copper at the point of contact. Thus may be secured the vaso-constriction of the positive pole without the ordinary hard cicatrix of that pole. I have never tried this and have never seen it commended, but unless there is some contra-indication it is well worthy of trial. I have been able to find but little in our literature on the subject of electro-therapeutics in ophthalmology. Silex,* of Berlin, has recently written on clinical and experimental observations in electro-therapy in ocular diseases. Of this I have seen only an abstract. Most of his conclusions are negative. Among the conditions favorably influenced by electricity was true trigeminal neuralgia when not symptomatic of brain tumor or rheumatism, the anode on the tender point, cathode on the neck. He advocates electricity for fibrillary twitching of the lids, scleritis and episcleritis. For this latter affection he uses the hydro-electric bath, warm water or saline, using either pole as active. He says: "A possible improvement has been obtained in opacities of the vitreous, none in choroiditis, retinitis and neuritis. Technique of application not given. In optic atrophy he uses electricity for its moral effect. I have used the electric bath with normal saline in a few cases of episcleritis and iritis, one to two milliamperes, positive pole in order to reduce the inflammation by vaso-constriction, but have never been able to note any results. The best summary of the ophthalmic use of electricity I have seen is by Jackson, System Physiological Therapeutics, Electro-Therapeutics, Jacobi, Vol. II. He quotes from H. Derby and Standish a report of four cases of retinitis pigmentosa in which there followed improvement in vision and field from galvanism, both poles being applied at temples at intervals of two to eight days for several months. In vitreous opacities methods are confusing and contradictory, and the evidence of improvement not convincing.

*Archives Ophthalmology, Vol. XXXI., No. 6.

Possible effect from galvanism (polarity not mentioned) in iritic exudates and adhesions. Detachment of the retina is to be treated by cautery, puncture large enough to remain open for some time; benefit doubtful. The technique of treatment of opacities of cornea is given. A concave silver electrode six mm. in diameter is applied directly to the cocainized cornea on negative pole, positive to cheek, the idea being to stimulate sufficiently to promote absorption, stopping short of inflammation. Commencing with one m. a. at first sitting, current is increased to four m. a. if well borne. Treatments are not repeated till irritation has subsided. Best results are obtained in opacities following interstitial keratitis. In optic atrophy electricity has proved of no value, and Noyes's* verdict is endorsed, viz.: "Electricity has failed to vindicate its pretensions to any real value, although by its capacity for exciting phosphenes, it fosters the hope of a credulous incurable." Meyers's** methor of treating trachoma appeals to me as rational, in that it reduces the hypertrophy with no destruction of palpebral conjunctiva. He inserts a fine platinum needle into each trachomatous body, negative pole, thus liquefying the firm tissue, one to two m. a., three or four punctures in each hypertrophy. The reaction is slight, twenty or thirty punctures may be made at one sitting.

Albert W. Horr, M. D.: I have been exceedingly interested in the reading of Dr. King's able paper. In attempting to look for some information on this subject a short time ago, I was surprised and disappointed to find such a paucity in our literature. My own experience in the practical application of electricity to the correction of eye troubles, I am frank to admit, has been very limited, confined, in fact, to its use some years ago, as an adjunct to prism training in cases of heterophoria, more particularly exophoria. Although using for some time the galvanic current in this way, I never felt sure that the treatment was very decidedly beneficial. I began using, in addition, massage, manipulating with the fingers upon the ball, through the closed lids. After trying this plan awhile, it seemed to me I was accomplishing more with the massage than with the electricity. I gradually abandoned the latter and followed my prism exercises with the massage, ending the sitting with a hot compress over the eyes for two or three minutes. This method has yielded fully as good results as did the galvanic current.

It is very difficult in cases of this kind to judge of the efficiency of any given method of treatment which is always used in conjunction with some other treatment. Unless we have a remedy, upon which, *used alone,* we may rely for relief from the symptoms, we must be somewhat uncertain as to the exact amount of credit which should be given to our remedy when used as an adjuvant.

I am glad to learn of Dr. King's use of electricity in cases of in-

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Noyes's Disease of the Eye, p. 693.

**Ophthalmic Record, January. 1900.

cipient cataract, and also in choroiditis, retinitis and diseases of the optic nerve. There is such difficulty in getting appreciable results from treatment in so many of these cases that I think we should all welcome any method which can show tangible results. Dr. King in having used electricity for fifteen or more years has certainly had an exeprience which entitles his opinion to more than usual recognition. I am very glad to have listened to such a paper from such an authority on the subject.

E. W. Beebe, M. D.: I agree with what Dr. King has said upon the treatment of the deeper structures of the eye. Some twenty years ago I read a paper on this subject before this society, and I have had no occasion to change the opinion then expressed concerning its usefulness. I use electricity daily; while it may not be able to absorb cataract, it is able to stop the progress of many diseases.

It does not make any material difference in my experience whether you apply the negative or positive pole to the part affected; I can see absolutely no difference in the result. I use one on the eye and the other on any convenient part of the body, as the hand; I prefer the galvanic current, and use from three to four and a half milliamperes. The patient will frequently experience benefit in three days, and vision improved not infrequently from three to five per cent. It is equally applicable in retinal congestions and where the eye is too irritable for the fitting of lenses, and where Atropine is often used. The electricity makes this unnecessary, and I long since discarded it. I use it also in the treatment of goitre with very gratifying results.

Albert E. Cross, M. D.: I think that the usefulness of electricity in the treatment of heterophoria depends much upon the cause of the phoria that you are treating. If you are satisfied that the cause is due to an actual weakness of the recti muscles then I can see the benefit to be derived from the application of electricity, if the current can be applied directly to the muscle affected. But if the phoria is only an evidence of an imperfect development of binocular fusion, which I believe it to be in a high percentage of cases, cannot see where any relief can be gained by the application of electricity. If we make careful tests of the fusion faculty before and after treatment, it not only aids in the diagnosis, but it gives us a clear idea of the ground gained and improvement made. Where good results have been attained without such acurate tests I should say that the improvement was psychical.

I agree, therefore, with Dr. Wells in the importance of making careful tests not only of muscle strength, but of stereoscope vision and amplitude of fusion before and after each treatment.

A. H. Worcester, M. D.: I wish to speak of a point suggested by Dr. Beebe. I have used electricity for eight years, and it has been a question in my mind whether it is doing any good or not, and if good, how much? I have never succeeded in improving vision. It is so impossible at present to say how a case would get on without treat-

ment. How are we to measure the benefit to a case unless we see an improvement in vision?

W. R. King, M. D.: I am very glad to note that Dr. Wells has evidently read the paper carefully, and dived below the depths intended to be reached by it. He has gone into much that the paper did not attempt to deal with. I do not exactly like the attitude of doubt expressed by some in regard to the work accomplished, because they cannot put their finger upon the spot nor demonstrate just how and where the good was accomplished. We often can be morally certain that good has been done to a patient without being able to measure it in figures. Accurate tests may be made in such things as heterophoria, where we can actually demonstrate the changes accomplished by the treatment. There may be cases in which the good accomplished is purely psychical in character, but I have not seen many such. In many of the cases that I have seen I have been able to positively demonstrate first the want of tone in the muscle, and then after treatment see the improvement. By means of the instrument spoken of in my paper you can see the thin, pallid, weak condition of the muscles. I also use the phorometer, Maddox's rod and the other tests. I stand corrected on the error of the interrupted galvanic current. In my experience the large number of cases (not all) that have responded to electricity massage, and so on, have been diagnosed and the condition demonstrated by various tests, and there is no question but that they have been helped actually and not psychically. Electricity is about the only thing recommended by the old school that does help.

PAPILLOMATA OF THE LARYNX.

BY H. S. WEAVER, M. D.,

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IN considering benign tumors of the larynx, papillomata are of the most frequent occurrence, more than outnumbering in all probability all the others combined.

They occur in all ages, from infancy to old age, and more frequently in the male than the female, but when found in persons over forty years of age a close watch should be kept upon them lest a growth, supposed to be innocent or benign, be in reality malignant.

The similarity in appearance of a simple papilloma and a malignant growth, especially of the epithiloma type, at the onset is very great, and not infrequently do we have negative reports from our pathologists upon specimens removed early from doubtful cases which later on are unquestionably found to be malignant.

Macroscopically they resemble very closely a seed wart, and consequently are not infrequently spoken of as warty growths of the larynx. They vary in color from a gray to a pale pink, and may be either single or multiple; when single the attachment is usually pedunculated and may be of sufficient length to allow the papilloma to fall below and underneath the vocal cord, so that during respiration the growth may be entirely out of view, and unless the patient phonates the larynx may appear entirely clear. In these cases, by directing the patient to say "a," the papilloma will be forced up between the bands, and at times the pedicle will be of sufficient length to allow the growth to rest upon the upper surface of the vocal cords, falling back into position as soon as the phonation ceases and normal respiration is established.

Others have a broad base involving almost all the surface of the vocal cords; these, while larger in size, present the same characteristic rough appearance upon the surface. The anterior third of the vocal cords is the most frequent location for the development of the papillomata, especially the single variety. In the multiple the attachment may be from almost any point in the larynx, at times involving the whole surface of one or both of the cords. They may grow from the ventricular bands, epiglottis or the posterior portion of the ory-epiglottic folds.

Inflammation, or a hyperæmia of the mucous membrane, such as found in acute laryngitis or acute catarrhal conditions, are the chief etiological factors in the production of these benign growths of the larynx. When occurring in children I believe adenoids in the nasopharynx should be classed as a factor in their production.

In many cases where the voice is used excessively, as in teachers and public speakers, the injury or inflammation is not the direct result of over-use alone, but of a faulty method of use, such as improper approximation of the vocal cords, requiring the use of considerable more muscular force than is normally essential for the production of tone. This additional strain causes a hyperæmia of the parts and renders the mucous membrane capable of acquiring a papillomatous infiltration.

The permanent cure of such inflammations, or hyperæmias, is not only in the use of the properly selected homœopathic remedy, or the local application of some remedy which will relieve the hyperæmic condition, but is in addition to this the selection of some good teacher in vocal culture who understands the mechanism of voice production and can correct the defects found.

I believe entirely too little attention is given to some of these minor points on the part of laryngologists today, and many of our patients would be vastly benefited should we look more carefully into the underlying causes of these laryngeal congestions, not being content to cure them, but strive to prevent them by correcting faulty methods in speaking and singing.

By the use of the laryngoscope the diagnosis in the discrete or single variety is usually not difficult especially in adults. The history, color, location, intent of involvement, age or duration of the growth will aid in the majority of cases in making a differential diagnosis of papillomata from malignant growths, especially epitheliomata, but occasionally the macroscopic appearances are so nearly alike and the superficial tissues so closely identical that the microscope fails to reveal the pathological differences; in this case it is best not to be too hasty in drawing conclusions; the fault may have been in obtaining only a superficial portion of the tissues, and in that case the microscopic appearances would be identical in both benign, and early in malignant growths; for this reason repeated observations should be made, and, if possible, a section from deeper portion removed and examined.

The difficulties encountered in making laryngoscope examinations in children render the diagnosis more uncertain, but where a continued hoarseness exists, which is gradually increasing, associated with attacks

of dyspnœa, especially aggravated at night, and by exertion not associated with nor accounted for by stenosis of the upper air passages, a diagnosis by exclusion can be made with some degree of certainty.

Papillomata.	*Malignant Growths.*	*Syphilis.*
Color is paler, varying from gray to pale pink.	Color is darker and frequently shows a zone of inflammation.	Color dark red, with more general infiltration of the tissues, and there is usually the specific history.
Is found in all ages from infancy to old age.	Found late in life, mostly after forty years of age.	
They grow in the majority of cases from the anterior third vocal cord except in the multiple variety, when they develop in all parts.	Usually grow from posterior end of vocal cords.	
Only involve the superficial structure, and motion is not interfered with.	Involves the deeper structures.	
No ulceration or pain.	Motion of cords limited or interfered with.	
	Later ulceration with severe pain.	

The symptoms of laryngeal papilloma are chiefly those of interference to phonation and respiration. In adults beginning as a laryngeal irritation which produces more or less cough with a slight degree of hoarseness which progresses as the tumor enlarges, until at times complete aphonia occurs. Rarely does dyspnœa take place in adults unless in the multiple variety, and then only by the growths being of sufficient size to obstruct the lumen of the larynx. In children there is a defect in the voice varying from a slight laryngeal congestion to hoarseness or complete aphonia, the growths are usually multiple, and, as the lumen of the larynx is small, obstruction to breathing soon develops, and dyspnœa is one of the prominent symptoms.

The composition of a papilloma from a pathological standpoint is of slender fibres of connective tissue, hypertrophied papillæ and proliferated epithelium; where the connective stroma are sparsely distributed and soft in character with the preponderance of proliferated epithelium, the growth is soft and friable, but where there is an increased amount of connective tissue with less epithelium the growth is firm and presents more of the fibrous form.

The papillæ may be few, but are usually numerous, producing the roughened surface which is so characteristic in papillomata. The epithelium is stratified, and both covers and dips between the papillæ.

In adults and in the single growth the hard or fibrous variety pre-

dominates, while in children and the multiple papillomata the softer ones are usually found. They grow from the superficial surfaces and never involve the deeper tissues as do the malignant growths.

The treatment of laryngeal papillomata may be divided into remedial and surgical, the remedial including the internal administration of such drugs which by clinical experience have proven efficacious in the removal of some of these growths, especially those of sudden and recent development, which appear to be of the softer variety.

It is true some of these tumors disappear spontaneously, and many men are prone, owing to this fact, to look upon those cures reported without surgical interference as a coincidence rather than the result of the internal effects of the drugs.

The remedies especially applicable are Thuja, Kali bich., Kali iod., Causticum and Mercury. When non-operative treatment is employed the best results are obtained by using the drug locally and internally, and the local applications should be made by the physician at frequent intervals, my method being the ordinary laryngeal application covered with a good sized piece of cotton, firmly wrapped, that there be no danger of losing it in the larynx, but allowing a very soft piece to protrude from the end of the probe, so there can be no damage done to the soft parts while making the application. The probe is dipped into the medicament and applied directly to the larynx.

At the same time I prescribe an atomizer with a laryngeal tip, and direct the patient to use this at home two or three times daily. I preferably use the tincture of Thuja, and always give my patients a trial with this remedy locally and internally before suggesting surgical interference, and I am very happy to state that I have six or seven cases to my credit completely cured by this treatment alone.

Two of them were cases that had been operated several times with recurrence each time, and by the internal use of *Thuja* 30, and local applications of Thuja tincture, they were entirely cured, and have not shown the least sign of a recurrence up to the present time, this treatment being given in 1894.

In these two cases it seems to me to be only just that the result should be attributed to the action of the drug locally and internally applied, and not the result of spontaneous recovery, because each time when surgically removed there was a recurrence. In the other cases, while presenting the same appearances in viewing them with the laryngoscope, none of the growth was removed, so that the diagnosis could be confirmed as in the former ones. I do not wish to place myself on record as one not

favoring surgical interference in these growths, because such is not the case. I am simply giving my own experience in these treatments.

In a great many cases the best selections of remedies and the most carefully applied local treatment over long periods of time have failed entirely, and surgical interference was the only treatment to offer the patient.

But now another treatment is added to our armamentarium, which I hope will aid us in the cure of these most trying and difficult cases, namely, "X-ray."

This, while only in its infancy, so to speak, has demonstrated without the shadow of a doubt, that it has a specific action on certain kinds of tissue, causing a shrinking or atrophy to follow its use.

Why not emply it in cases of laryngeal papilloma, especially where an intra-laryngeal operation is out of the question because of sensitiveness of the larynx even to the slightest instrumentation, and with children when at best intra-laryngeal operation is so difficult.

Dr. Shallcross reported a case the other day when X-ray treatment had been employed, with the result as follows:

After the third raying the patient was decidedly aggravated, the growth being inflamed and much enlarged, but the treatment was continued daily for two weeks, at which time the growth had decreased about one-third, and now, at the end of four weeks, the raying being done every second day, the growth is less than half its original size. The rayings were done by Dr. Bailey with the medium vacuum tube and the static current, each treatment lasting from ten to fifteen minutes. In this case the growth has been thoroughly removed several different times, but had recurred. Thuja both internally and externally, had been used over long periods of time without the slightest effect.

The results of this case, it seems to me, is sufficiently encouraging to warrant its employment in more of our cases, particularly those which recur after thorough removal, or where the patient is too nervous, or not willing to undergo operation.

By the surgical treatment a thorough and complete removal of the growth is attempted. This should be done by the intra-laryngeal operation, unless very special indications call for extra-laryngeal, because of the increased amount of danger to the patient in the latter operation. These operations, even in adults, are difficult, and require experience, but when done upon children, become more so, and in the majority of cases should be preceded by a tracheotomy.

Some cases of spontaneous cures have been reported following tra-

cheotomy, probably due to the absolute rest given the parts. It has been my good fortune to see one of these cases.

The operation was performed for the relief of dyspnœa, and after wearing the tube for about eight or nine years, a complete absorption of the growth had taken place.

It is not within the province of this paper to discuss all the different operations applicable in these cases, but suffice it to say, that each case should be carefully watched, and the treatment given, be it medicinal or surgical, which offers the best results with the least danger to the patient's life and vocal apparatus.

DISCUSSION.

E. D. Brooks, M. D.: In discussing such a paper as that of Dr. Weaver's on papillomata of the larynx, one needs to have had a wide experience such as comes only to one connected with a large hospital or one who lives in a large city and comes in contact with many persons who use their voices continuously in singing or speaking. As neither of those conditions have fallen to my lot, I have tried hard to beg off from leading in this discussion, as what I have to say in the discussion will be largely theoretical.

That papillomata are the result of improper use of the voice in tone-production in either singing or speaking, and that many fine voices are annually ruined by improper training or no training at all, is painfully evident. And the further fact that not every person who sets himself up as a teacher of voice culture or elocution is fitted to have charge of a voice that has been partially ruined by improper use is equally evident.

It has been the writer's misfortune to see a number of voices of great promise go all to pieces under the training of one of the teachers in a widely known school of music. The laryngologist who would successfully restore a voice injured must not only be deft at manipulating the larynx and able to distinguish when the condition is brought about by faulty tone-production, but must be able as well to send such patients to an instructor properly qualified to bring about the desired proper use of the voice. Happy indeed is the laryngologist who has the co-operation of such a teacher, and whose patients are willing to take the required course of training. The element of time in the treatment of these cases is as great a desideration as it is in the treatment of chronic catarrhal deafness, and one should be careful to state to his patient, at the outset, that months or even years may be required to complete a cure; otherwise the patient may become discouraged and cease treatment or seek help elsewhere.

The indicated remedy is most effective in the early stages of the disease and before the growths become organized, and the same is true of the use of topical applications. It is usually only when organization has taken place that operative measures become imperative, except in cases

of threatened asphyxia or where the growth is pedunculated and the process of absorption is liable to be very slow. In cases of this nature I have found the use of a solution of Adrenalin chloride, one to four thousand, gives very satisfactory results.

As for the use of internal remedies the question arose in my mind when reading that he used Thuja θ, whether the medicinal effect was not obtained from the latter by absorption, if at all; though, of course, no harm could come of the administration of the thirtieth; also, whether from a pathological standpoint, such remedies as Arnica, Rhus and Cimicifuga would not occasionally be indicated. Of course, one should give the remedy indicated by the totality of the symptoms, when it is possible to ascertain the similimum, and a diligent study of one's Materia Medica may be a necessary adjunct to the treatment. The nasal passages should receive attention and nasal breathing be insisted upon, as mouth breathing is one of the prolific causes of pharyngeal difficulties.

Thomas L. Shearer, M. D.: During the reading of Dr. Weaver's paper several lines of thought took very decided possession of my mind. First, the question of diagnosis between the benign and malignant new formations in the larynx. No doubt you all remember the case of the late German Emperor Frederick, who developed a small growth on one of the vocal cords, and in order to clear up the diagnosis a piece of the tumor was removed by Sir Morrell Mackenzie and submitted to Professor Virchow for examination. The report stated that the specimen did not show any evidence of malignancy, yet very soon after this the case revealed signs to the contrary. In this instance we have the removal of a piece of the new tissue by the most skillful laryngologist of his time, and the microscopic examination made by the world's greatest pathologist. In Germany, with an early diagnosis of cancer, the complete extirpation of the larynx would have followed, as the local surgeons, such as Von Bergmann, insisted from the very commencement of the case upon such an extreme measure; but when Virchow's report indicated the probability of a benign formation, Mackenzie naturally would not allow his royal patient to submit to what might, according to statistics, turn out a fatal operation. It may sound very well, as an excuse, to say that often portions of tissue removed near the surface do not show cancer formation, but deeper parts do or would do so if similarly examined; the fact remains that in many laryngeal papillomata one finds even epithelial nests so very similar to malignant disease that some authors have actually suggested the term "benign epithelioma." Again, local irritation is one of the greatest factors in producing new growths, particularly those of a malignant nature. We have the blow upon the mammary gland; the jagged tooth irritating the tongue; the heated bowl of a clay pipe, whose stem is broken off, constantly causing epithelioma of the lip; soot accumulating in the clothing producing the scrotal cancer of English chimney sweeps, and so on. In the larynx irritation of any kind may stimulate the epithelial structure to malignant activity. At times microscopic examination of specimens *do* reveal the

serious type of disease, but *in many instances do not,* even when the growth is cancerous. The risk of auto-infection following the removal of portions of a growth must be remembered.

When the laryngeal tumor is very small and the patient possesses an irritable or unusually sensitive throat, the repeated attempts to obtain a specimen, even when made by an experienced operator, may cause an otherwise harmless growth to develop malignancy. Considering, then, the risk of auto-infection, the frequent failure of the microscope to give an accurate and unquestioned clear diagnosis, and the danger through excessive irritation from the use of endo-laryngeal instruments, of converting a simple growth into one of a fatal character; I wish to enter a protest against such methods, and to go on record as being absolutely opposed to the removal of portions of a laryngeal new formation for microscopic examination. It seems to me that there is too much tendency to depend upon our laboratory for diagnosis and too little use of our eyes and brains. It is always possible to keep cases like these under very close observation, and by a careful study of the growth, paying special attention to its point of origin, its general appearance, location, rapidity of development and the general history, to endeavor to arrive at a diagnosis. If we happen to encounter a case whose nature puzzles us, the microscope will probably, when the disease is *far advanced,* give serious information, but about as suddenly and as uselessly as the method of testing the question of mushrooms or toad stools by eating them and awaiting for results.

In papillomata of the larynx in children and in young adults, the post-nasal vault should always be explored for adenoids; if present, they should be removed and the larynx watched, as such papillary growths at times disappear when irritation of the larynx from mouth breathing is removed. As Dr. Weaver states, tracheotomy will sometimes afford laryngeal repose, and the growths disappear. All things considered, I prefer to avoid as much as possible the employment of endo-laryngeal instruments, and above all, caustics, chemical or electrical, whenever any other measures can be first carried out. The X-ray treatment of these conditions is, as yet, in its infancy, and it is sincerely to be hoped that it may before long prove to be an unfailing remedy for benign and malignant growths in the larynx. Where the tumor mass is large, it would appear desirable to perform a preliminary tracheotomy before using the X-ray treatment, as swelling of the growth from initial irritation precedes the necrotic change leading to its removal.

R. S. Copeland, M. D.: I do not agree with Dr. Shearer as to the value of the microscope in settling the diagnosis of doubtful tumors about the larynx. It seems to me that his use of the Emperor Frederick's case was based upon the conclusion that he died of malignant disease, and I would like to ask whether Dr. Shearer has ever read Dr. Mackenzie's defence, entitled "Frederick, the Noble." If he would, I think that he would be convinced to the contrary; the Emperor died of septicæmia from tracheotomy. When I read that book I felt like

apologizing to Dr. Morrell Mackenzie for the opinion that I had formed, for I then saw that he was right and I was wrong. I commend what the writer says upon the subject of voice culture. I have been able to find few places or institutions where the voice was properly trained. In the use of the X-ray I have wondered if it was not usually recommended and used for too long a time. I have felt that we have overdone it by too long periods of treatment.

C. E. Teets, M. D.: I want to emphasize what was said about Thuja; it is a most successful treatment for papillomatous growths. I use it both locally and internaly; the fluid extract locally and the tincture internally. An excellent way is to apply Chromic acid in crystals fused on the end of a probe to destroy the tissue, and apply the Thuja locally and administer it internally; when this is done I believe that the growths will never return. I had one myself about thirteen years ago, which was removed by the forceps, Chromic acid applied and also Thuja. It has never returned. I have treated at least forty cases in that way without a single recurrence.

H. S. Weaver, M. D.: I do not know that I can add anything to what was said in the paper and discussion. I have often thought of using Chromic acid, but most of my patients have very sensitive throats, and I have been afraid to try it. To make a laryngeal application of so caustic a substance safely, you should have an absolutely quiet throat or you will get where you do not want it. On the other hand, with the Thuja, you can make a dab and wet the parts no matter how sensitive the throat is, and the surplus does no harm.

ELECTRICITY IN DISEASES OF THE EAR.

BY CHARLES LESLIE RUMSEY, A. M., M. D.,

Baltimore, Md.

ELECTRICITY has been used in medicine from time immemorial, but our ignorance regarding the most elementary facts has failed to give us the results for which we looked. We not only failed to differentiate between the positive and negative poles of the galvanic battery, and the different sized coils of the faradic battery, but even failed to appreciate the field for application of the different currents themselves. We now know that if two poles of a galvanic battery are introduced into living tissue, electrolytic decomposition takes place. The acids and oxygen are attracted to the positive pole and the alkalies and hydrogen to the negative pole. As a result, the therapeutic effect of the two poles is entirely different. The positive pole is hæmostatic, coagulating and sedative; the negative pole is irritating, softening and produces absorption.

There are certain laws of polarity which may afford a key to the solution of the axiom that "Nature abhors a vacuum." It may be the vacuum is really the negative polarity, which attracts the inrushing positive elements. In view of the value of this fundamental fact of polarity, a wider recognition of the essence of its basic meaning, attraction and repulsion would do very much to illuminate and simplify the difficulties that beset the path of the medical electrician. The problem is, where shall the negative and postive electrodes be placed upon the body plane of suffering? Shall the current expend its ultimate energy at the negative end, or at the positive, or at the point midway? If we divide the body into anterior and posterior planes and remember that the former is governed by the latter, it would seem that a more rational and exact application of the force might be made to the patient. If we also remember that the negative attracts the positive, and so place the electrodes as to come within the meaning of this national dictum, it would seem that many of our difficulties in electrical treatment would disappear and definite and universal therapeutic results would follow its application to the patient. We know that in the faradic batteries there is a vast difference in the therapeutic effects of a current from a

short, thin wire (the current of quantity) and the current from a long one (the current of tension). One is a current of volume, which produces stimulation, the other a current of intensity, which has sedative influences. One acts on the muscles, the other acts on the nerves, increasing the circulation and assisting the absorption of exudation. From these facts we can readily see the indications for the different size coils. While these facts guide us unerringly to the proper current, and the correct pole or coil in well defined cases, there are times we must use our own judgment, not only to poles and coils, but as to the proper milliamperage, as in the proper selection of the homœopathic remedy.

It is not a simple single remedy, acting the same way under all circumstances, but is a veritable Pandora box, out of which spring many different forms of energy, some of which are recognized with scientific exactness, while others, as yet, are unknown.

Electricity will, however, be better understood as a therapeutic agent, as it is more used in medicine. It is the similia when the tired nerves are crying for more food; it is the life force that can supply the little capillaries so speedily.

As I find no literature on the subject of electricity to the ears, I urge its study and application to ear work, believing its uses may be manifest by a conjoined experience of our members. As the operative field is probably more limited in ear work than any other speciality, can we not find in electricity a helpful remedy for atrophic conditions, relaxation of tissues, chronic inflammations with exudations, hystero-neurosis, and maybe affections of the labyrinth?

While occlusions and strictures of the Eustachian tube may be removed by bougies or medical solutions through the catheter, there are cases where electricity alone has been efficacious in my experience. The location of the Eustachian tubes makes it impossible to institute surgical methods. We can use Duel's gold wire electrodes from 2 to 4 milliamperes connected with the negative pole of a galvanic battery and the positive pole at the angle of the jaw. I have felt the obstruction give way while applying the current to allow the electrodes to pass through the stricture. An oily solution—I use Morgan's Sabalol—is then injected through the catheter, after which I use gentle pressure from the nebulizer or air bag to diffuse the oily medicament.

Electricity is of undoubted value in hysterical cases. I have used the phono-faradic apparatus as suggested by the late Dr. Henry C. Houghton, to whom we are so much indebted for many suggestions pertaining to ear work. I have had only two patients thus affected; in both

cases the deafness was in the left ear alone. There was tinnitus with usual hysterical symptoms, all of which were entirely relieved in both cases. I gave no remedy in either case, using only electricity. In catarrhal deafness I have used the massage by Wappler instrument, Gary's instrument or the like, combined with galvanism and faradism. The latter current has been most efficacious where there is tinnitus. The positive electrode is placed on the neck and the negative pole is connected to the stethoscope for both ears; the rubber tubing is attached to the massage instrument. I have this combination attached to a rod and side pieces with a spring on the back of a chair. The electrical stethoscope and cords are applied from behind the chair so that nothing is in front of the patient.

In labyrinth troubles I have not had any results in the electrical treatment. This is surprising to me, as I have expected improvement in these cases.

Electrical devices for testing hearing are now too massive for practical uses. The subject matter appeals to me as the most scientific method and must be utilized for this purpose when a less complicated and cumbersome apparatus is devised.

The instruments invented by Mr. Hutchinson, brought to our notice at Richfield Springs meeting, is destined to hold a valuable place in ear armamentarium. The instrument is operated by electricity. It is necessary to produce the frictional movements of the joints which this instrument allows. When these joints are united by calcareous and fibrous deposits, making one rigid mass, the weaker sounds fail to move this heavy mass and the hearing is in consequence impaired. The phonetic vibrations are of a sharp, impinging character. They cause every particle of the auditory apparatus which the sound waves strike to be thoroughly agitated.

The efficacy of the therapeutic power of electricity in ear diseases has been a mooted question with me. It has cured the cases of hysteroneurosis. The combination method, the massage and electricity, at the same time has seemed to help tinnitus and hearing, but I could not do ear work without vibratory treatment. While I have cheerfully complied to the request of our president to write on "Electricity in Diseases of the Ear," I regard this paper as valuable only in the discussion that may come from it, to note the aggregated experiences of the members.

In conclusion, the only definite results I can attribute to "electricity in diseases of the ear" are, first, hysterical cases; second, Duel's gold wire electrodes for the Eustachian tubes.

For other diseases, I have used electricity in combination, which preclude any exact value to the electricty.

DISCUSSION.

J. Ivimey Dowling, M. D.: The remedial application of electricity to diseases of the ears is a subject well worth considerable study, and detailed reports of experimental research for electro-therapeutics is a subject of vital and ever-increasing interest, which is now an accepted and honored adjuvant treatment for numerous diseases. We, as aurists, should seek to establish its actual value as applied to the treatment of the diseases affecting the special sense organ under consideration.

The author calls attention to the importance of distinguishing between the negative and positive poles when employing the galvanic or constant current, and emphasizes the different qualities of effect obtained from the use of faradism, resulting from the length and thickness of the wire through which the current is transmitted. Axiomatically, the gist of the matter is the importance of considering *details* in attempting to apply electricity to diseased conditions wherever located. This proposition is at times neglected, and accounts for the dissimilar effects resulting from supposedly identical treatment. The corollary serves to impress the necessity for accurate reports on the part of the original investigator in order that other experimentalists may be enabled to substantiate the primary observations, These points must be borne in mind if electricity is ever to win a positive and generally accepted place in the treatment of aural affections.

The doctor urges the study of electricity as applied to the treatment of diseases affecting the ears for the reason given that "I find no literature on the subject of electricity to the ears." Surely Dr. Rumsey could not have intended to have made such a statement, for, on the contrary, the subject has been investigated more or less for many years, and Scheppegrell informs us in his comprehensive work, published in 1898, that "Grapengiesser and Ermann, 1812, referred casually to the application of electricity to the ear," and since then others have formulated theories and published their views at varying intervals. Among the publications of recent time that of Duel has probably excited the greatest interest, and to me the reason for this is that Duel realized the value of details, and study of his writings will enable anyone to properly apply galvanism to the treatment of Eustachian stenosis.

In looking over the literature on ear diseases I have failed to find any author who writes more clearly than Woakes, and in his treatisce, entitled "Deafness, Giddiness and Noises in the Head," second edition, and published in 1880, the subject under consideration is well described, and seemingly is the model which has served many writers during the succeeding twenty-three years.

Woakes made use of galvanism and faradism, the former proving serviceable in deafness due to "defective innervation," and also in the treatment of "paretic deafness," in which the tensor and levator palati

and tensor tympani are involved. In addition he made use of the constant or galvanic current for the relief of "tubal deafness," which he considered resulted from a paresis with consequent stenosis of the Eustachian tube and subsequent impairment of the normal ventilation of the tympanum and more remote effects on the ossicular chain and attached muscles. He seems to have employed faradism to a lesser extent, but suggests its use when rigidity of the ossicles or inactivity of the tympanic muscles is present.

Woakes describes two methods for applying electricity in the treatment of the ear. In one method he made use of a special pharyngeal electrode passed through the mouth and applied posterior to the soft palate, and the other electrode on the neck over the superior cervical ganglion, which is reached by making deep pressure behind the angle of the lower jaw. In his second order of procedure he made use of an insulated catheter and sponge tipped wire electrode applied within the Eustachian orifice, and inserted through the nostril. The opposing electrode was placed over the mastoid process close to the pinna.

Mild dosage is advised, but the proper selection of poles is not indicated. More recent authors advise the use of the negative pole to be applied within the Eustachian orifice, and the other to some indifferent part when the constant or galvanic current is employed. Barr is one of several who suggest the efficacy of galvanism in relieving otalgia, but no serviceable directions for its use are given.

My personal experience has been extensive in the use of galvanism as advised by Duel, and merely serves to corroborate the reports of others and furthermore establish the value of this agent in relieving stenosis of the Eustachian tube and consequent impairment of hearing and subjective noises. Reference to one particularly brilliant effect, obtained from the use of Duel's method, illustrates the pronounced success occasionally observed. Dr. P. consulted me in reference to his ear, and gave a history of constant tinnitus continuing for three years, and which came on suddenly while suffering from an acute rhinitis. He had sought treatment at the hands of five accredited aurists without obtaining the slightest benefit. Various diagnoses had been made, but the prognosis of everyone of these gentlemen was that no relief could be afforded, and that it would progress, and eventually the opposite ear be involved in the loss of hearing and probable associated tinnitus. Examination revealed pronounced hypertrophic rhinitis and apparently similar condition of the right Eustachian tube, which was markedly stenosed. I diagnosed stricture of the tube of hypertrophic character resulting from the nasal condition. Treatment of the tube as advised by Duel enabled me to overcome one dense and two softer strictures, and, finally, the bougie passed well within the tympanum, and as soon as the bougie was withdrawn the doctor exclaimed: "Why the noise is gone." This happy relief continued for several days, when a second treatment was equally successful. However, the doctor has failed to follow up the required treatment, and now experiences some tinnitus, but to a less degree. To accomplish permanent relief in this case opera-

tive treatment of the nasal cavities is essential, and special care of the Eustachian stenosis is necessary for a prolonged period. I have cited this case because it illustrates the wonderful possibilities of immediate benefit resulting from galvanism of the Eustachian tube, and also the probability of relapse unless treatments are continued regularly and for a prolonged season, and in addition it emphasizes the need of remedying nasal defects in order to accomplish permanent benefit of aural affections.

At present I am experimenting with galvanism in the treatment of chronic suppurative otitis media with extensive destruction of the membrana tympani and associated spongy condition of the Eustachian tube. My method is to first cleanse the tympanum and Eustachian tube, and after careful drying of the parts I introduce a gold bougie *into* the tube, passing it well within the tympanic cavity, and having accomplished this without the aid of any current, I then attach the *positive* pole to the bougie and apply the negative to an indifferent part, such as the hand. The current is then turned on, and, if possible, continued for a full minute, and then the polarity is reversed in order to permit the bougie to be withdrawn readily. Two or three m. a. is sufficient dosage, and a voltage of thirty-five to forty is required. In one case such treatment employed but once succeeded in checking the purulent discharge for a period of six weeks, and the spongy tympanic cavity became firm and protected with an epithelial covering. At the end of six weeks the discharge reappeared, and had its origin in a granulation springing from the attic, but the Eustachian tube has remained free. A second case treated in like manner has remained free of discharge for five weeks, and the perforation in the membrana tympani has *closed*. In both cases only one treatment was given, and the subsequent treatment consisted in simple cleansing of the parts without using *any* astringent or germicidal solutions.

I only submit these suggestions hoping that others may likewise conduct similar experiments, and from accumulated evidence the true value of the procedure be established.

Cataphoresis may be obtained with the aid of galvanism, and I have made use of it in some cases of extreme chronicity, which have resisted other methods of treatment. I am unable to report a single successful result, but suggest its trial in trying suppurative conditions with granulations in the tympanum. Those who may be interested are referred to Scheppegrell and Elliott.

Faradism has served me satisfactorily in a few instances when applied externally over the Eustachian tubes, and a mild current employed and continued during the space of five minutes, and the polarity reversed two or three times during the treatment. Some patients claim to experience relief of subjective symptoms which they describe as a "stuffiness," or "a blowing noise," and whenever I have accomplished such favorable result I have found the pharyngeal muscles decidedly relaxed or even paretic.

In closing, I wish to state emphatically that all of the aforesaid uses

of galvanism and faradism are with me, personally, still *sub judice,* and my data is, as yet, incomplete and unsatisfactory, but even so the results obtained warrant further research, for I believe that electricity is an important adjuvant in the treatment of diseased conditions of the ear, and the accumulated evidence of many investigators will finally enable us to establish its actual field of usefulness as applied to the treatment of the especial sense organ under consideration.

A. W. Palmer, M. D.: I have been experimenting along this line with the high frequency current, and I would like to ask those of you who have this form of apparatus convenient to give it a thorough trial. In one case of tinnitus and deafness that I treated with it, accompanied by an eczematous condition of the external orifice, I did not think much of the skin inflammation at the time, but after the third treatment the eczema cleared up and the external auditory canal became quite healthy. The case came only for a few treatments, discontinued, and then returned about two months later; at that time they called my attention to the relief that had been experienced of the chronic skin disease.

This form of electricity, I find, enables me to help ear troubles more quickly than I have otherwise been able to do. I have had cases relieved by the Wappler pump for a time, and when they came back with an aggravation, I found that the high frequency current gave quicker as well as more enduring relief. In thickened and sclerotic conditions of the drumhead the deafness has been improved. The electrode that I used is a vacuum tube surrounded at the end with a pear-shaped shield, for the reason that I found that there was considerable irritation of the external ear from the disseminated current, this irritation occasionally causing a small smarting vesicle on the tragus or anti-tragus about twelve or twenty-four hours after treatment (a burn).

H. D. Schenck, M. D.: It occurred to me while listening to the vastly varied results from the use of electricity that it might be very helpful if we knew the voltage of the current used. We might find the key to account for the difference in effect. There certainly seems to be room in this subject for future study and experimentation.

C. L. Rumsey, M. D.: I consulted a good deal of literature on this subject, and found that it was unsatisfactory. Like Dr. Schenck, I was going to suggest that the different results that were reported might be due to a difference in the voltage. On this subject we should all work together, using the same voltage and the quality of current until we have established some data to work with. We can get no definite information about electricity until we all use the same kind of current, and in the same way and as far as possible use it alone. My experience coincides with that of Dr. Palmer's; I have obtained results from the high frequency current that I have not obtained from the other alone.

ARTIFICIAL MEMBRANA TYMPANI.

BY HERBERT DANA SCHENCK, B. S., M. D.,

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ARTIFICIAL membrana tympani were proposed in cases of perforation as long ago as 1640 by Marcus Banzer, by Leschecin, in 1763; Autenreith, in 1815, and Lincke, in 1840. These devices were not used to improve the hearing (indeed as ordinarily applied they were an impediment) but as a protection to the mucous membrane of the middle ear. They consisted mostly of delicate tubes with a varnished membrane stretched over one end, which was worn in the auditory canal.

An artificial drum membrane to improve the hearing is said to have been suggested to Dr. Yearsley, of London, about 1840, by an American, who found he could improve his hearing by using a twisted roll of paper. Yearsley experimented with paper in various forms unsuccessfully, but finally settled upon the well-known cotton pellet which is now so commonly used.

He published his results in 1848, and a year later, Erhard, who had independently hit upon this device, made the same suggestion. The attention of specialists was particularly called to this use of artificial membrana tympani because of the favorable results published by Toynbee in 1852, who had invented the thin sheet of rubber to which is attached a silver wire for placing it in position.

In the last half century various modifications of the carriers and forceps for properly placing the different artificial drum membranes by the patients have been proposed, notably by Yearsley, Hassenstein and Delstanche, and lint, silk, linen, paper (Blake) and sticking plaster (Gruber) have been tried.

Politzer has suggested cutting a piece from a rubber tube two or three m. m. thick and one c. m. long and mounting this on a stout piece of wire. This is said to be effective in many cases and so cheap that it can be used by dispensary cases. Another rubber device is to insert a tube of vulcanite as long as the canal with the end cut square or obliquely, so as to rest against the remnant of the membrane. Politzer says this is very effective in some cases. He also proposes, in case much

of the membrane and all the bones except the foot-plate of the stapes have been destroyed, to insert a stapes taken from a dead body and fastened to one of Toynbee's membranes, which is cut to fit securely into the perforation with the stapes resting against the oval window. The stapes and artificial membrane must be thoroughly sterilized by boiling before they are introduced.

No one substance or device seems to meet the requirements of all cases, but different ones must be tried until the best is found for a particular patient. The experience of Dr. C. H. Burnett, of Philadelphia, accords with mine, that the cotton pellet or a disk of sized paper will give the best results, one or the other proving satisfactory in all except a few special cases.

Toynbee's membrane either causes discomfort from the irritation of the canal by the wire, the troublesome crackling from movements of the jaws in eating or from the rivet holding the rubber disk to the stem irritating the mucous membrane or the membrana tympani. The same has been true in a less degree of the rubber tube and the cotton pellet in the experience of the writer.

Many authors advise that patients be taught how to apply with forceps or a wire the pellet, as they do the rubber devices. The forceps are best, for then nothing is left to irritate the canal, a thread fastened to the pellet making it possible for the patient to withdraw the cotton when necessary. It is usually easier, however, for the patients to adjust the pellet for the best results with a wire stem or with Hassenstein's or Delstanche's instrument. Much depends upon the position of the cotton and its pressure, a very little change making a great difference in hearing obtained.

Where the discharge has ceased entirely, the pellet can be moistened with liquid vaseline or one of the bland petroleum oils. Politzer advises the use of one to ten of oleate of zinc and liquid vaseline, which I have not tried. These moist pellet are often comfortable when a dry one causes irritation. They may, however, prove too stimulating and set up again a mild discharge, which can often be controlled by insufflating a layer of boracic acid into the cavity before putting in the pellet, which can be impregnated with boracic or salicylic acid.

While aurists generally from Dr. Yearsley to the present have advised the frequent removal of the pellet and its readjustment by the patient, beginning by using it only a few hours or during conversation, and in most cases only during the day, it has been my experience that this often defeats the *protective power* of an artificial membrane

and destroys its stimulating effect in causing an exudation to be thrown out that results in closing the perforation in some cases. Not only will an artificial drumhead improve the hearing but it will cause a slight discharge to cease by protecting the mucous membrane and keeping it free from secretion.

If the physician adjusts carefully a cotton pellet or a disk of sized paper, placing the former in the upper and posterior portion of the membrana tympani so it may press on the stapes if the other bones have been eroded and thrown off by the discharge or so as to press them into a better position where they are present, a perforation will have a greater chance of closing where this is possible by leaving the artificial drum membrane in position as long as it causes no irritation and keeps the hearing at the maximum. The ear should be examined from time to time, to see that the disk or pellet is in proper position, and that it is fully covering the perforation. While the cotton pellet is very helpful in these conditions, the disk of sized paper first suggested by Dr. C. J. Blake, of Boston, about thirty years ago, is, in my experience, more useful. It is usually worn without irritation, and will remain, in favorable cases, in position for several weeks before it will be carried toward the periphery and again expose the perforation. In some cases it is best to not remove the first disk, but to apply another so as to cover the exposed perforation. In case this blunts the hearing both should be removed and a new disk put in. These disks should be made of thin, tough paper that will not easily tear, cut so as to be slightly larger than the perforation, or in other cases to lap out on the walls of the canal to get the best hearing. In one case so great was the annoyance from the ordinary noises of the street and home when a large disk was in position that one only just the covering of the perforation was possible without discomfort. After the disk has been trimmed into the correct shape it should be moistened with one to one-thousand bichloride solution and then placed in position with a pair of fine forceps and a small probe with which it is carefully adjusted so as to closely adhere to the membrane at the edges: in fact, to almost become a part of the membrane itself. Its position should be adjusted with the probe higher, lower or with more or less pressure on one portion than another until the best hearing results and the ear feels perfectly comfortable. It may be necessary to introduce the artificial membrane several times before the best position is found.

An artificial membrane should be tried in all cases of present or past suppuration where a perforation remains in the atrium and where there

is marked deafness on one or both sides. The size or shape of the perforation does not make much difference, equally good results being obtained in small as well as large defects. No case of deafness which has resulted in perforation should be dismissed until a number of artificial membranes have been tried, perhaps a number of times each, and a careful test of the hearing made, especially for the voice, before and after the membrane is put in position. Only decreased hearing, tinnitus or pain should cause an abandonment, and then only after different appliances have been tried.

Although Politzer and others say that artificial drum membranes are contra-indicated in children except to ascertain whether they may be useful in future, the writer can see no reason why they cannot be successfully used after babyhood where there has been neglected suppuration and considerable alteration or destruction of the membrana tympani.

The improvement in the hearing depends largely upon the anatomical changes in the middle ear. It is not uncommon to have the hearing for the voice increased from three to four times. Politzer reports that he has seen the improvement so marked that those who could only make themselves understood by writing were able after artificial membranes were in place to hear sentences spoken into the ear, and in some cases to resume useful occupations.

The paper drums, and to a less marked degree the other forms, will cause a permanent improvement in the hearing in some cases, while in others the improved hearing disappears with their removal. In the case of the paper disk the gradual creeping toward the periphery which takes place causes a trial finally of the hearing without the help of the artificial membrane of which the patient is unconscious until his family notice the failure in function and urges that the membrane be replaced.

Paper disks. when applied in the way suggested, it would seem, rather uphold Toynbee's contention that increased resonance is caused by the artificial membrane rather than Lucæ's suggestion of increased labyrinthine pressure, Knapp's more normal position of the chain of ossicles, or Erhard's view that the articulation of the bones is closer from the pressure applied.

The following cases are presented not because they show more marked improvement than many others, but because they have been under observation for some time, and I have been able to keep track of them up to date:

Case One.—Mrs. S——, aged 59 years, who had always enjoyed good health, was first seen March 1, 1900. She gave a history of considerable discharge from the left ear every winter since childhood, which apparently ceased in summer to be aggravated by the first acute rhinitis in the fall, to which she was very subject. There had been a rather profuse discharge since the previous December. She had always enjoyed good hearing in the right ear until after the removal of a cystic ovary and the uterus in 1898, which nearly proved fatal. During convalescence she noticed a marked deafness, which has continued, and had been worse since a discharge set in several months before I saw her. The right canal had some dried debris and discharge near the m. t., partly obscuring a perforation the size of a small tack head, just anterior to the manubrium. In the left a perforation covering two-thirds of the atrium and destroying the manubrium was filled with a bland, watery discharge with some tendency to granulation about its edges. The hearing was as follows:

R. H. D. W. V. = 20 c.m.	L. H. D. V. = 10 c. m.
R. H. D. ac. = 3 c. m.	L. H. D. ac. = 1 c. m.
R. H. D. watch = $^1/_{30}$.	L. H. D. watch = $^1/_{300}$.

It was almost four months before the discharge was overcome. In July, 1900, the hearing was as follows:

R. H. D. W. V. = 22 c. m.	L. H. D. V. = 70 c. m.
R. H. D. ac. = 18 c. m.	L. H. D. ac. = 5 c. m.
R. H. D. watch = $^1/_{300}$.	L. H. D. watch = $^1/_{300}$.

The ears were treated for several months with massage in an effort to improve the function, but there was little response, the hearing remaining about as above recorded up to the time she ceased treatment in 1901. A few months later a cotton pellet was inserted over the perforations, but without increasing the hearing much. Paper disks were then tried with marked success. While the paper drums do not greatly improve the hearing in the left ear, in the right a large disk so increases the hearing for noises of the street and household that they become uncomfortable and only one projecting over the border of the perforation is permissible. These disks remain in position from six to twelve weeks, when she finds a diminishing function requires their replacement. It might be mentioned in passing, that the application of some oil to the old disk will facilitate its removal, as it usually sticks very closely to the wall of the canal or the remnant of the membrane, making removal somewhat painful.

The hearing for the past eighteen months has remained about like the following measurement, which was recently made, although she claims that she hears public speaking and conversation much better without the disks than when their application was begun:

R. H. D. W. V. = 20 c. m.	L. H. D. W. V. = 13 c. m.
R. H. D. ac. = 15 c. m.	L. H. D. ac. = 3 c. m.
R. H. D. watch = $^{1}/_{300}$.	L. H. D. watch = c.

After the paper drums were applied it was as follows:

R. H. D. W. V. = 50 c. m.	L. H. D. W. V. = 16 c. m.
R. H. D. ac. = 15 c. m.	L. H. D. ac. = 8 c. m.
R. H. D. watch = 2½ c. m.	L. H. D. watch = 1 c.

Case Two.—Mrs. K——, aged 46 years, enjoying good general health, has suffered with a suppurative otitis media following scarlet fever when she was between three and four years old. There has been more or less discharge from the left ear almost continuously since that time, and during childhood she was quite deaf, but afterwards her hearing considerably improved, especially on the right side. Since July, 1898, the deafness in the right ear has considerably increased, and there has been a slight discharge from a small perforation between the membrana tympani and the wall of the canal over the entrance to the Eustachian tube. With this there has been a composite tinnitus in that ear, and some ringing tinnitus in the left. The hearing at her first visit, March 7, 1900, was as follows:

R. H. D. W. V. = 40 c. m.	L. H. D. V. = 50 c. m.
R. H. D. ac. = 50 c. m.	L. H. D. ac. = 8 c. m.
R. H. D. watch = $^{8}/_{300}$.	L. H. D. watch = h. c.

In the left ear there was a muco-purulent discharge, more from the upper part of the Eustachian tube than from the middle ear, whose cavity was largely exposed from the large perforation in the atrium, which had destroyed two-thirds of the membrane and along with it the manubrium. I have not yet overcome wholly the discharge in the left ear, some stringy mucus still exuding from the Eustachian tube. She was treated the better part of the year, which resulted in the discharge from the right being overcome in a few months, and that from the left hanging on stubbornly and refusing to yield to treatment. In 1902, when the ear had become thoroughly cured of the discharge, the hearing was as follows:

R. H. D. W. V. = 20 c. m.	L. H. D. V. = 20 c. m.
R. H. D. ac. = 10 c. m.	L. H. D. ac. = 10 c. m.
R. H. D. watch = $^{1}/_{300}$.	L. H. D. watch = h. c.

After the paper disk was applied to the right ear the hearing arose so that the

R. H. D. W. V. = 90 c. m.
R. H. D. ac. = 45 c. m.
R. H. D. watch = $^{6}/_{300}$.

At this time the discharge was very slight from the left ear, and the paper disk was applied on that side and resulted in making the

L. H. D. V. = 300 c. m.
L. H. D. ac. = 80 c. m.
L. H. D. watch = 12 c. m.

The disk was retained in place but a few days on account of the discharge floating it away, and the hearing returned to its former condition. Since this she has worn a disk in the right ear almost constantly, having one applied at intervals varying from four to ten weeks. On May 19, 1903, R. H. D. W. V. = 130 c. m. A paper disk was applied on that side and the hearing distance was made 530 c. m.

Case Three.—Mrs. K—— has been ill for the past three months suffering from an abdominal burn by an X-ray, and between May 19th and June 11th, when she was last able to come to the office, has taken quinine in five-grain doses daily, which she felt has decreased her hearing. Before the paper disk was removed the

R. H. D. W. V. = 40 c. m.
R. H. D. ac. = 17 c. m.
R. H. D. watch = $^{2}/_{300}$.

The hearing had fallen since the disk was applied from 530 to 40 c. m. for the w. v. After removing the paper disk the R. H. D. W. V. = 70 c. m., and after applying several different disks in an effort to improve the hearing, I was only able to make the R. H. D. W. V. = 100 c. m. This is the poorest hearing she had had at any time in eighteen months after a paper disk has been placed in her right ear, and it seems to me that at least a part of it is due to the inflammation produced in the middle ear by the constant use of the quinine for the previous three weeks. There was no evidence of nasal catarrh or other conditions to cause any loss of function.

The third case illustrates the futility of the paper disk in perforations near the ligament or in Schrapnell's membrane.

Case Four.—Miss M. C——, aged 25 years, has had an intermittent discharge from the right ear since childhood from a perforation posteriorly just below the ligament. There has been considerable deafness in this ear with tinnitus for many years. Last February, following a severe rhinitis, she developed suppurative otitis in both ears, the first time, she claims, that anything of the kind ever occurred on the left side. I saw her a month later, when there was a small perforation in the left m. t. just anterior to the manubrium, at its lower extremity. The suppuration on the right side soon yielded to treatment without any increase in the size of the perforation. The left was very stubborn, small granulations repeatedly forming on the promontory. At present

the discharge on the left side has ceased, but about one-half of the atrium has been destroyed. On June 11th the

R. H. D. W. V. = 100 c. m.	L. H. D. V. = 90.
R. H. D. ac. = 23 c. m.	L. H. D. ac. = 6.
R. H. D. watch = $_{2}/_{800}$.	L. H. D. watch = c.

After paper disks were applied to each perforation the

R. H. D. W. V. = 100 c. m.	L. H. D. V. = 300.
R. H. D. ac. = 26 c. m.	L. H. D. ac. = 15.
R. H. D. watch = 3.	L. H. D. watch =2.

This shows the vast difference in the benefit derived in the use of the paper disk where there is a large perforation in the lower two-thirds of the atrium and the small benefit to be derived from the use of it in the upper third near the ligament.

I have another person who has a perforation posteriorly and just below the ligament where no resulting benefit was obtained from either a paper disk or a cotton pellet.

Case Five.—In another case there is an old perforation in the left ear which had no suppuration in it for several years; the hearing in the right ear has been within the past year considerably impaired from chronic catarrh, otitis media. A paper disk about three times the size of the perforation was applied with the hope of mitigating the tinnitus somewhat on that side as well as to improve the hearing.

L. H. D. W. V. = 35 c. m.
L. H. D. ac. = 350 c. m.

Before the application of the paper drum. After a paper disk was in place the

L. H. D. W. V. = 70 c. m.
L. H. D. ac. = 400.

Case Six.—Another is a young woman who had had a left-sided suppurative otitis with a polypoid growth springing from the wall of the canal, which was carious, who had been under treatment during the past winter. Her hearing before the growth was removed was as follows:

L. H. D. V. = 70 c. m.
L. H. D. watch = $^{8}/_{800}$.
L. H. D. ac. = 68 c. m.

After removing the growth:

L. H. D. V. = 90 c. m.
L. H. D. watch = 1 c.
L. H. D. ac. = 35 c. m.

With a cotton pellet in place on June 13, 1903, the

L. H. D. V. = 100 c. m.

Without the cotton pellet:

L. H. D. V. = 300 c. m.

After a paper disk, twice the size of the perforation, had been applied:

L. H. D. V. = 650 c. m.

These cases which have been selected from a number of varieties show the benefit that can be derived in the different kinds of perforations by the use of paper disks, and I think demonstrates fairly well that in a very large number of cases their application will be of the greatest functional help.

DISCUSSION.

J. M. Patterson, M. D.: The most marked result I have observed from use of "artificial drums" was in a case of what might be called a collapse of walls of the meati, and was effected by one of the best advertised of all the artificial drums. It consisted practicaly of a thin rubber tube with a conical closed end nearest the membrana tympani that fit snugly into the meatus. The patient bought this after reading an advertisement in one of the monthly magazines. The improvement in the hearing was almost marvelous. In this case there was no perforation of membrana tympani nor did this membrane seem the least abnormal. The cases due to collapse of meatus are evidently rare.

This exceptional case and the results made many sales for this particular artificial drum, and it happened to be my good fortune to have the privilege of observing a number of the cases who tried this, but in no other case was there noticeable improvement in hearing.

The essayist has given us in his paper a very thorough and practical report of the present status of the artificial membrana tympani, but from considerable experience in efforts to improve hearing by these means, I must say that he has been more successful in getting improvement in his cases than I, as well as several of my acquaintances with whom I have talked on the subject, have been able to do. I agree with him that the sized paper disk has given satisfactory results in more cases than any other means, and next to this would come the bit of absorbent cotton, and this improvement, in my opinion, is brought about through the alteration in the tension of the chain of ossicles.

As a means of restoration of a perforated membrane no method has accomplished more than the paper disk, but closing of a perforation, while it affords protection to the intra-tympani mucous membrane, does

not always improve and frequently reduces the hearing. In a few of these cases, that is, after restoration of the membrane, good results have been obtained by first dropping into the canal a few drops of Mullein oil, allowing it to remain five to ten minutes, then very gentle massage by means of Seigle's pneumatic speculum, or one of the pneumo-massage machines. Probably any other oil or none at all would answer as well. The little instrument of Gruber's for introducing artificial drums enables one to place the disk on the desired location with so much ease that it is certainly worth having. I always moisten the side of disk that is to lay next to membrane with a little bland ointment or vaseline, unless there is still some discharge, when I use a solution of bichloride, 1 to 1000, or refrain from use of disk until the ear is perfectly dry, as I do not think it wise to attempt a closure of the perforation till all discharge has ceased.

While disappointment will oftener result than improvement, the number of cases benefited is sufficient to justify us in attempts to improve every case of deafness that presents itself by some form of artificial drums, and in concluding my part of this discussion I can say nothing better than to repeat with emphasis Dr. Schenck's statement, that "No case of deafness which has resulted in perforation should be dismissed until a number of artificial membranes have been tried, perhaps a number of times each, and a careful test of the hearing made, especially for the voice, before and after the membrane is put in position; only decreased hearing, tinnitus or pain should cause an abandonment, and then only after different applicances have been tried."

H. S. Willard, M. D.: The writer of this paper has left little unsaid on the subject for me to add. I must admit that my personal experience with artificial drumheads has been somewhat limited, though in one or two cases I have had their value firmly impressed upon my mind. I have never used any of the manufactured article, but have confined myself to the cotton pledget. In one case of chronic suppuration with a perforation low down posteriorly, and which had been open for several years, after fortunately securing a cessation of the discharge, I applied a pledget of cotton saturated in ether and vaseline (equal parts), which improved the hearing markedly, and, to my surprise, caused a closure of the perforation. This case bore out the contention of Dr. Schenck that it is not always harmful to allow the artificial body to remain in the ear for some time, as on different occasions this patient retained the pledget for over a week without renewal.

It seems a pity, however, that such a boon as the artificial drumhead has proven itself to be, should be so abused as it is in the hands of the charlatans and the laity. No doubt many of you have had like experiences to one which befell me several months ago. A lady suffering from sclerosis of the middle ear was importuned by a friend to buy an extensively advertised ear drum, which was claimed by its makers to be a relief in all forms of deafness. She did so, and inserted one in each ear, of course with no benefit. There was no wire piece by which it could

be removed, so the patient used the every-ready hair-pin, and succeeded in setting up a periostitis of the canal as well as an acute exacerbation of her catarrhal trouble, which not only caused much pain, but resulted in poorer hearing than before.

The one peculiar point in regard to their use, to me, is, that no one as yet has hit upon a tenable theory as to their mode of action, and that their action should differ so in exactly similar cases.

Alton G. Warner, M. D.: We are under obligation to Dr. Schenck for his paper, as it treats of a rather neglected subject.

Personally, I feel that although I have used artificial membrana tympani to some extent, I have not given the time, care and patience which is required to secure the best results.

In some cases now under observation, the results are very satisfactory, hearing being improved to three or four times the former standard. If this can be accomplished on some cases I fell sure that there is hope for others whom we now permit to drift into the hands of charlatans.

Wm. A. Phillips, M. D.: I have tried to demonstrate the value of the artificial drumheads in quite a large number of cases, and I give it as the result of my experience that the pledget of cotton, as a rule, is the most satisfactory. It is best for the most part to allow the patient to adjust it himself, as I learned first from the following experiment: A young man applied to me to learn if anything could be done to help his hearing, having lost both drumheads from suppuration. His hearing was greatly reduced, it being necessary to speak in a very loud voice to make him understand. I tried all the different forms of appliances in use without any satisfaction, and then employed the pledget of cotton. I inserted one several times without improvement Finally, he woke up suddenly and said: "I believe I can adjust that better than you." He took a tooth-pick out of his pocket and experimented a few moments and brought about great improvement. He has got on well now for more than two years. Every day or two he inserts a new pledget of cotton. If the aurist will take the pains to allow the patient to adjust the artificial apparatus himself, helping him as much as possible, the patient soon learns by the result just what is necessary. Better results will frequently be secured thus than if the aurist tries to do it all himself.

A Voice: How long should the cotton be allowed to remain?

Dr. Phillips: Let it alone as long as the hearing is good, remove and replace it by another when the hearing becomes dull

H. P. Bellows, M. D.: Let me trot out my best case; we all like to talk about our successes! Fifteen years ago a small boy was brought to me for consultation about his ears, which were in very bad condition. He had been barely brought through a severe attack of scarlet fever. One ear proved, on examination, to be in a necrotic condition, so I removed the fragments of necrosed bone and cleaned the ear out. The hearing of that ear was gone absolutely. In the other ear all the bones

were gone except the stapes. Here he was, a bright intelligent boy, handicapped for life unless something could be done for him. Without hearing there was poor chance of success in any walk of life. I started upon a systematic trial of all kinds of appliances, and finally adopted a form of the cotton pledget which he could apply himself. He has continued to do this for the last fifteen years, carrying always a small metallic box to hold the prepared pledgets and a small pair of forceps with which to insert them.

The form of pledget that we finally selected as the most useful was a cotton drumhead, so to speak. A piece of absorbent cotton was first spread out as thin as possible; the periphery of it was then picked up, bent inwards and delicately twisted until it resembled a little balloon with a stem. This was saturated with vaseline, the head flattened out and the stem twisted closer and tighter and cut to the proper length with a pair of scissors It now resembled more than anything else a large carpet tack; the head of the tack representing the drumhead and the stem the handle used in placing it in the ear. By means of this little device, this boy, otherwise so deaf, became an active member of society, completed his education, went into business and has become a successful business man. He still comes to see me occasionally to shake hands.

H. S. Weaver, M. D.: My practice is to make artificial drumheads out of oiled silk, the thinnest that I can get. I teach the patient to cut out a disk from this material, about the size of the membrana tympani. This is then threaded by means of a fine needle with a piece of fine thread, and the patient allowed to adjust it himself. One of my very deaf patients, by using one of these appliances in each ear, has succeeded in improving his hearing to such an extent that he can hear ordinary conversation, and would not be recognized for a deaf man. He showed it to a friend of his, who applied it with success to an old lady relative, and had the business instinct strongly enough developed to put them on the market, and is making money out of it. It is known as the Morley Artificial Ear Drum. It is claimed that the oiled silk is especially prepared in some way so that it may be allowed to remain in the ear for three months without cleaning, but it is really the same as the one that I first made.

E. H. Linnell, M. D.: My method is very similar to that of Dr. Bellows, but I think that the stem that he has devised is an improvement. I moisten the pledget of cotton with boro-glyceride and dip it in powdered boracic acid; this stiffens it and makes it adhere to the drum fragments in the injured ear. It should be made very thin; the boracic acid makes it stiff enough to apply properly.

E. B. Hooker, M. D.: I just want to put a suggestion in the form of a question. I have not tried the idea myself, as I am not, as most of those present here are, an exclusive specialist, but have to engage in general practice also. The idea came to me in connection with the animal membrane that is used after operations for appendicitis, to prevent adhesions

of the bowels to the abdominal walls. A piece of peritoneum is laid over the appendical stump or the raw site of the appendix after its removal, and this bit of membrane becomes incorporated with the surface of the intestine and thus prevents adhesions of the wall of the abdomen at that point.

Now would it not be possible to take a suitable piece of animal membrane and lay it over the membrana tympani so that it would become incorporated with it and form as near as possible a natural artificial drumhead. It might be taken from the buccal surface of the patient and put right in the ear.

David A. Strickler, M. D.: I too have used the moist cotton pledget. The liquid I find most satisfactory in chloro-phenique. It is a good antiseptic and does not produce any discharge.

I used it first in a young lady who had suffered from otorrhœa from childhood. Under appropriate treatment the discharge ceased, but as the ears became dry the hearing was greatly impaired. This led me to try moistened cotton pledgets, which greatly improved the hearing, but it took me some time to find a preparation that would not start up the discharge again. Chloro-phenique proved saisfactory, and has continued entirely satisfactory for seven years; there has been no discharge and the hearing is greatly improved by the moistened pledget which she adjusts daily.

H. D. Schenck, M. D.: I have not been as successful as many who have spoken in getting the patient to intelligently apply the artificial appliances themselves. I have never made the cotton pledgets in the manner described by Dr. Bellows, and I should judge that the stem would be an improvement. It is evident that we need more experimentation along this line, and it would be a good thing for us to take up.

THE RELATION OF POLYPOID GROWTHS TO ACCESSORY SINUS DISEASE.

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AMONG the many problems that the laryngologists have been called upon to solve, few have proved more interesting than accessory sinus disease and the relationship that may or may not exist between nasal polypi and these suppurative conditions. Inquiry into this subject was retarded at the very outset by the confused ideas concerning the pathology of tumors in general, and necessarily included nasal growths whose origin seemed particularly mysterious. When we also realize that until recently the whole question of sinus suppuration was practically a terra incognita, the difficulties in the way of ascertaining whether the polypoid changes in the nasal mucosa were in any degree the cause or the result of nasal suppuration were not diminished. In order to analyze and to present this topic more clearly, let us first take up some general considerations about nasal polypi. Prof. Moritz Schmidt* has, in a tabulated form obtained from his own practice during ten years, observed that of 781 cases of new growths in the nose, 757 were mucous polypi, the rest being divided as follows:

(a) Fibroma, two in men.
(b) Papilloma, six (three men, three women).
(c) Lymphoma, two in women.
(d) Lympho-sarcoma, two in women.
(e) Cyst, one in man.
(f) Sarcoma, six (one man, five women).
(g) Carcinoma, five (three men, two women).

Of the 757 cases of polypi, 462 were in men, 295 in women. It is only necessary to glance at these figures to realize how greatly mucous polypi preponderate over all the other growths in the nose. Now what is the nature of polypoid growths and what gives rise to their formation? These growths undoubtedly are the result of the over-nutrition of inflammatory processes, and are best termed œdematous polypi. They are

*New Growths of the Upper Air Passages.

often called myxomata, which macroscopically and microscopically they resemble, but in the greater number of cases they are in the nose the product of chronic inflammations, and as serous infiltration is their most pronounced characteristic it seems better to speak of them as œdematous polypi. It should be remembered that whether these growths are pedunculated or sessile the histological structure is the same and is about as follows: The epithelium resembles that of the neighboring mucous membrane, columnar ciliated cells in the upper part of the nasal cavities and non-ciliated below. At times owing to the attrition of the surface or other irritation, such as pus flowing from the ethmoid sinuses, the cilia may be lost from the columnar cells and the latter become more or less flattened, looking like the type of the squamous cell. The layers may become thickened either uniformly or digitations may be present, dipping into the stroma at intervals. In other instances the epithelium is not altered. The stroma is separated by the effused serum into bundles, leaving spaces between. The size of these spaces or meshes and the quantity of the stroma fibres differ greatly, apparently according to the degree and the age of the process. The fluid contains some mucin and fibrin. Round cells of different sizes are found in the meshes of the stroma and in the fibrin. These and connective tissue occur most abundantly near the blood-vessels and glands, when the latter are present. Glands are usually scanty, and if present are generally observed in or near the pedicle. In some instances the glands may be very greatly dilated so as to form cysts which occupy nearly the whole of a pedunculated polypus. The sessile forms occasionally, also, contain these cysts. Blood-vessels are scanty and of capillary size, being found just under the epithelium. Nerves have been demonstrated in the stroma. The pedicle is made up of the firmer unseparated stroma of the mucous membrane.

"Now the histological structure of these polypi, the fact that they are composed of or infiltrated with little round cells, the way in which especially the vessels and glands are surrounded by such little round cells, and continuous connection of the growths with the basal submucosa or the periosteum, indicate to us their inflammatory origin."* As confirmatory of this view, Suchanek** observed in acute catarrhal inflammation of the mucosa "areolar connective tissue with wide, serum-filled meshes, strikingly large, filled with finely granular material,

*Grunwald (Nasal Suppuration).

**Mon fur Ohrenheilk, 1893, 4.

partly exudation;" acute inflammatory œdema, practically indistinguishable from the chronic process as it presents itself to us in œdematous or mucous polypi. Further, an experience of Grunwald in this connection is instructive. Both antra had been opened and firmly plugged. Not the slightest trace of tumor formation had been observable beforehand, but the very next day in both nostrils a gray, shining, movable, polypus-like swelling appeared on the lower edge of the hiatus semilunaris. The plugs were removed. Next day the left tumor was entirely gone, and the right almost so. The last trace of it soon disappeared. Here we had an acute development of polypi from inflammatory œdema, reinforced by the stasis due to the plugs." The term polypoid degeneration is applied to a condition whose histology is the same as that of œdematous polypi, both being the product of chronic inflammation of the mucosa. In cases of long-standing or in those which have undergone repeated operations for removal, the consistence of these growths becomes firmer, the natural effect of increase of the stroma in proportion to the serous contents. *The exact microscopical picture will therefore depend largely upon the age of the polypi and upon the amount of irritation to which the new growth has been subjected.* To account for the origin of polypi, several theories have been advanced. One is that the effusion of serum into the tissues is produced by some vascular change, the nature of which is as yet not well understood. Another theory, termed originally by its author, Dr. Woakes,* of London, "Necrosing Ethmoiditis," was first announced in 1885, and raised a perfect storm of opposition. "He observed a slow dragging inflammation in that part of the ethmoid which projects into the nose, occurring as a consequence of catarrh, the acute exanthemata and injury; all leading to periostitis and necrosis. The disease was progressive and never healed spontaneously. It first became apparent by the formation of growths on the middle turbinal, which thus enlarged. Later, polypi or rapid growing myxomatous tumors developed and led to necrosis of the thin bony laminæ. Neighboring cavities, too, like the antrum became infected." Woakes evidently had an idea that polypi were always and only due to necrosing ethmoiditis. Schaffer,[1] in 1885, followed up the work of Woakes, but with more accuracy of detail, his cases including three of polypi associated with ethmoidal empyema and necroses of bone. In two of them the empyema was latent, and had in all likeli-

*Brit. Med. Journal, 1885, April 4.

[1]Deutsche Med. Woch., 1890.

hood originated from a closed empyema. In 1890 he reported eighteen more cases; in three of them polypi were associated with necrosis, in several others dilatations, cysts and bone cysts of the middle turbinal were found. In addition to purulent ethmoiditis Bosworth[2] recognizes two forms of ethmoidal disease, namely, extra-cellular and intra-cellular myxomatous degeneration. By this he means polypoid de-degeneration of the mucous membrane of the middle turbinal and the internal mucous membrane of the ethmoid cells, which often is found in suppurations and catarrhs of this region, leading eventually to the formation of pedunculated polypi. Now, before taking up the question of empyemata, let us see from what points polypi are most frequently found to grow, and then what sinuses are most commonly the seat of disease. In the vast majority of cases œdematous nasal polypi have their origin from the mucous membrane covering the middle bone or from the portion of the ethmoid near the hiatus semilunaris. These growths, however, may be found at any point within the nasal cavities. At the posterior end of the turbinal bodies and on the septum we may find the sessile type combined with dilatation of the blood-vessels; rarely the pedunculated variety is encountered in these localities. Some polypi grow from *under* the anterior border of the middle turbinated membrane, *between it* and the *external wall* of the nose. At this point it may also be well to remember that the three accessory sinuses most frequently the seat of empyemata—the anterior, ethmoidal, the antral and frontal—have their openings or drainage aperture into the nasal chamber very near one another in the middle meatus. How can we account for the origin of an empyema? In the case of the ethmoidal cells, the sphenoidal sinus, the frontal sinus and in many of the cases of antral disease, an acute catarrhal process, an acute rhinitis, has been supposed to be the primary cause, but it is more than likely that these are really examples of infection at the very onset of the classical symptoms, profuse serous discharge with swelling of the mucosa, malaise, headache, fever, pains in the limbs and often prostration. The secretion repidly becomes purulent, and varies greatly in quantity. One "cold" after another may be contracted with apparently merely the result of increasing the thick discharge and the empyema is developing. The streptococcus and the staphylococcus are in many of these acute attacks of rhinitis in reality the primary cause of the symptoms. Quite recently

[2]New York Med. Journal, 1891, Nov. 7.

Kirkland and Stacy,* of Sydney, Australia, have made some investigations into the bacteriology and pathology of sinus suppuration. The examinations, which cover the period of one year, were made upon 100 subjects. During four months of this time an epidemic of influenza occurred and a number of cases of pneumonia proved fatal. In eleven out of twenty-two cases of pneumonia, one or another of the sinuses were involved. In eight of them the sphenoidal sinuses contained pus, while in three a clear fluid was present; thus, in 50 per cent. of those dying of pneumonia, the sphenoidal sinus was involved. Of the entire number of cases dying of various diseases no less than thirty-five were found to contain pus in one or the other cavities. If the twenty-two fatal cases of pneumonia are deducted from these, there are only thirteen cases left in which suppuration was present, thus demonstrating the greater prevalence of the affection in pneumonia. Are we then justified in assuming that the pneumococcus plays an important role in the production of accessory sinus mischief? In addition to the thirty-five cases of purulent sinusitis, it is stated that in twenty more fluid other than pus was present; this fluid is described as being clear. Are we justified, after considering these facts obtained in the post-mortem room, in concluding that these sinuses became involved shortly before death? As it is difficult to believe that so many individuals could have been the subjects of sinus suppuration for any length of time prior to the illness that proved fatal, I think that we are. According to Lambert Lack the most probable explanation of this sinus involvement is that the cilia become enfeebled or may cease to act during the fatal disease. In this way the fluid actually secreted in the cavity becomes stagnant and accumulates. With the deficient action of the cilia the organism find more ready access, and thus infection of the cavities may take place; after death either a clear or a purulent fluid may be found, according to the stage of the process. The different varieties of organism observed after death in the accessory sinuses are tabulated by Stacy. A difficulty is experienced in distinguishing the exact form of organism present in many of these cases, as, for example, a pneumococcus from a staphylococcus which has assumed a diplococcal arrangement. A subdivision of the cases is made into those in which the fatal illness was of an infective nature, and into those dying from non-infective causes. Of the former (infective ones) there were about sixty-four, and of these thirty-four showed some affection of the sinuses, while the remain-

*Journal of Laryngol., London, Nov., 1902.

ing thirty did not. In many of the thirty-four cases only a few of the sinuses were affected, and in some of these at least there was reason to believe that the condition was not due to the current disease but to a previous one. Streptococci and staphylococci were the organisms found and also diplococci resembling the pneumococcus. An amaerobic organism is said to be the cause of antral suppuration where the origin of the mischief has been traced to a diseased tooth. Now, after carefully reviewing the above-mentioned points and also bearing in mind the cases of polypi and sinus disease observed and treated in our own practice, what conclusions may be safely and honestly drawn? 1st. That nasal polypi arising, for the most part as they do, from the mucosa covering the middle turbinated bone, tend naturally toward the pedunculated form from merely obeying the law of gravitation.

2d. That nasal polypi are always the product of an inflammatory process in the nasal mucosa whether the irritation causing such inflammation comes from within or is of an abextra character.

3d. That owing to the peculiar construction of the turbinated membrane, with its ever varying circulation, now engorged, now nearly emptied, a continued slight interference with the return of blood from any one spot would readily end in a localized œdema; if the œdema persisted, a polypus would result, sessile at first, and, later, probably pedunculated.

4th. In some people, living in a changeable climate and who contract colds easily, the attacks of acute rhinitis so frequently repeated, may leave the nasal mucosa relaxed at points, and thus pave the way for these serous growths.

5th. Some cases in which repeated recurrence of the growths takes place and which do not betray any evidence of sinus disease or underlying bone changes can only be explained on the ground of a constitutional tendency to tumor formation; I have known of such persons in whom polypi of the uterus and rectum were also found.

6th. Necroses of the ethmoid, rarefying osteitis, bone cysts are all found in a number of cases of nasal polypi, and undoubtedly are the immediate cause of polypoid development, an infection being the primary cause of irritant.

7th. As in a large percentage of cases of polypi, seventy-one out of eighty-two, Grunwald* found focal suppuration, it is only fair to con-

*Loc. cit.

clude that in these instances the pus was the irritant and caused the growths.

8th. If polypi through pressure produced a retention suppuration, why have we all seen cases in which the entire nostrils were filled with growths, and yet there was no suppuration? Such conditions I have encountered in very neurotic subjects and found them apt to have bronchial asthma as well; in other words, in subjects predisposed to vaso motor changes.

9th. That where suppuration has been associated with growths, it is quite possible that the infection has been carried into other previously unaffected sinuses by the strenuous attempts on the part of the patient to clear the nasal passages by the use of the handkerchief. For the same reason—sudden increase of air pressure in the nose—the use of vaporizing apparatus under too great pressure may work damage in the same way.

10th. That some cases of polypi have been repeatedly and apparently most radically operated, with constant recurrence, until a previously unrecognized empyema was cured.

11th. That those cases of antral and frontal suppuration which also exhibit polypoid degeneration are the most difficult to cure. Why? Because the mere fact of the presence of such degeneration indicates the chronicity of the process, the change in the membrane being secondary to the pus.

12th. In cases of sinus suppuration observed for years when we knew very little about such troubles, the polypi were first noticed some time after suppuration began.

13th. That in the greater number of cases of sinus suppuration the primary cause is to be found in microbic organism, usually several types producing a mixed infection. In a very few instances, metals, like lead, mercury, zinc and phosphorus, may give rise to antral disease.

14th. In many cases of nasal suppuration no polypi, indeed not even an apparent tendency to such growths, can be observed. Why is this?

a. Because polypi associated with sinus disease do not, as a rule, develop until late in the course of nasal suppurative processes.

b. Also because one of the essentials in the production of polypi is local irritation and a certain degree of nasal obstruction; interference with the circulation in limited areas of the mucosa. This often does not exist until years after suppuration has begun.

c. Also of great importance is the amount of space between the sinus aperatures, the turbinates and the septum. The smaller the space

the sooner we are apt to have polypi formation; but this statement applies only in each case to the exact region in which the growth occurs, and may take place in a nasal chamber, roomy throughout the remaining portion.

15th. Polypi which occupy positions at the drainage aperatures of nasal sinuses may, and no doubt often do, cause a certain degree of retention of secretion within such accessory cavities, but that does not in the least prove that the sinusitis was originally caused by these growths blocking up the outlets to the normal secretions.

16th. In view of the number of cases of polypi in which focal suppuration has been observed to exist, we are justified in every instance in searching for the presence of pus; if this cannot be found we should next look for evidences of local bone changes. Until these two factors have been excluded one should not consider the case to be one of pure uncomplicated polypus.

17th. While some authors, Thurston and Martin, claim that in everyone of the polypus cases examined by them the underlying bone was diseased—rarefying osteitis being frequently present—it would be well to suspend judgment upon this point until further investigation in this field can be carried out. Certain it is that in some of my own cases no recurrence of the growths took place after thorough removal with the cold snare, neither could any evidence of suppuration or diseased bone be discovered. It is therefore probable that these growths do not always have exactly the same pathological conditions associated with them.

DISCUSSION.

J. N. Anderson, M. D.: This paper of Dr. Shearer's I regard as being a very able and important one, especially as to the etiology and pathology of rhinitis as leading to the production of polypi and the involvement of the accessory sinuses. His deductions, I think, in the main are reasonable and sound. The few words which I have to offer will be along the line of etiology mostly.

A writer of a recent paper on hypertrophic rhinitis claims as a basic predisposing cause of this disease the revolutionary processes which the structures of the head have been undergoing through many generations in reaching the present size of the cerebrum and face, especially of the Caucasian race, and that while the fœtal head is larger than other races, yet the facial parts of the Caucasian at birth is strikingly diminutive and compressed as compared to the other parts of the body. The author claims that departure from aboriginal conditions may and undoubtedly do by contraction of the nasal spaces give rise to the hypertrophic rhinitis so often occurring in early life. Whether his conten-

tions are true or not, I have strong convictions that interference with the influx of air in respiration is a frequent cause of the diseases of the accessory sinuses. As a rule, I have found in the cases coming under my observation that the air spaces, even under best conditions, are only partially free. When such a nose becomes inflamed and swollen the middle and superior turbinals are in a favorable condition for producing a relaxed mucosa of the sinuses and retention of secretion and resultant ostitis and all its usual following.

It is generally conceded, I think, that the middle turbinal is the first part to show signs of rhinitis, and the one most involved when the sinuses have taken on a pathological condition. Nor is it strange that it should be so when we consider the fact, now well established, I think, that the influx of air in respiration instead of following the passage of least resistance along the floor of the nares passes obliquely upward, striking the middle turbinals.

Again, the air is often laden with dust, and in our cities especially, carrying with it various irritating substances, and in city and country the pollen of certain cultivated and wild flowers. Add to this the present modes of dress and unnatural methods of living, and the common use of alcoholic beverages, and the persistent tobacco using in all its various forms with their relaxing effect on the vaso-motor nerves, can we wonder that diseases of the nasal passages and their accessory cavities, which we know is often caused by impaired metabolism, are so much more manifest now than in the recent past? It is generally conceded that the acute exanthemata is a most frequent cause of the acute suppurative disease of the accessory cavities of the nose. Instead of the turbinals, as one author claims, being one of the most senseless irregularities of nature and unnecessarily deformed and lacking in nature's conservatism, the wonder grows that so many persons are comparatively free from nasal deformity and disease of these structures.

The so-called Sajous discovery of the functions of the ductless glands, which he names the "adrenal system," is of interest in our consideration of the subject under discussion, in throwing some light to aid in the discovery of some of its causes. To the anterior pituitary body he gives the office of governing (through the nervous system) the functional activity of the adrenals, and to the thyroid bodies the function of raising to their highest efficiency the vital activity of all tissues. (It has thus become apparent, he says, that while exophthalmic goitre is the result of adrenal over-activity, myxodema and its infantile form, cretinism, are due to adrenal insufficiency.) Dr. Sajous regards the posterior pituitary body as the general centre of the nervous system, while the posterior body adjusts the functional activity of all organs through the nervous system. He has shown by experiment that a double adrenectomy produces the symptoms of cholera and toxic doses of quinine and arsenic, while in tuberculosis pneumonia is the anterior pitulary body. In fact, he says vulnerability to any disease whether inherited or acquired means insufficiency of the adrenal system of ductless glands, because as a result we have reduced oxidation, entailing

impaired metabolism and nutrition of all structures including the heart.

In view of the prominent position that thyroid extract and adrenalin occupies in the therapeutic field today this discovery that Dr. Sajous claims to have made, is worthy of investigation. Of the structures implicated acromegaly and gigantism, which is claimed by some authors to be caused by disease of the pituitary bodies and other authors by disease of the pineal gland, is the turbinals. This investigation of Dr. Sajous seems to indicate the close relationship between the metabolic processes of the body and of the nose.

The disease under consideration seems to lie along the border line between general and special practice, and emphasizes the contention of many in the profession as well as among laymen that a specialist should be a well posted all round physician, and that the general practitioner should know a good deal in the fields of specialism in order for either to be a safe adviser and successful in practice.

A. W. Palmer, M. D.: Mr. Chairman and fellow members—After thoroughly perusing this paper nothing but commendation can be given. The present condition of our knowledge is portrayed fully and without bias, every phase we think of at present being touched upon in the seventeen conclusions.

From this consideration we find that polypi are not the result of one single cause, but are rather one or two of several causes; therefore, after the removal of these growths we should endeavor to ascertain the cause or causes in the individual case and administer remedial measures therefor.

Furthermore, since we have seen that the majority of polypi are caused by previous diseases of the accessory sinuses, and as it is believed by many of our best authorities that that disagreeable and intractable disease, ozoena, is generally the result of sinus inflammation, it behooves us rhinologists to still continue the study of the nasal sinuses. Although there is much literature regarding them, still I feel that our actual knowledge is quite meagre.

Personally, I would like to thank the author for stating succinctly the present state of our knowledge upon this subject.

T. L. Shearer, M. D.: The application of caustics to the middle turbinate membrane, as recommended by Dr. Anderson, does not meet with my entire approval. If the polypoid formations are located upon an area of diseased underlying bone, the use of chromic acid introduced well into the membrane can only have the result of increasing the inflammatory process. We should also remember that the ethmoid cells are very near the brain, and in a position, through the lymphatics, to act as a source of infection if the injudicious use of chromic acid sets up a severe necrotic process in the turbinate membrane. The difficulty with chromic acid, even when applied, fused upon the end of a probe, is to limit its area of action.

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CONSTITUTION.

ARTICLE I.—NAME AND OBJECT.

This association shall be styled the American Homœopathic Ophthalmological, Otological and Laryngological Society, and its object the study of the eye, ear, nose and throat, with particular reference to Homœopathic therapeutics.

ARTICLE II.—MEMBERS.

The society shall be composed of those physicians who are already members, and of such others as may be hereafter chosen in conformity with the by-laws.

ARTICLE III.—QUORUM.

At any meeting of the society eleven members shall constitute a quorum.

ARTICLE IV.—OFFICERS.

The officers of the society shall be a president, two vice-presidents, a secretary, and a treasurer, who shall also constitute an executive committee of the society.

ARTICLE V.—AMENDMENTS.

This constitution may be altered or amended by a vote of two-thirds of all the members present at the regular annual meeting, provided that notices of such alternation or amendment shall have been given in writing at a previous annual meeting of the society.

BY-LAWS.

ARTICLE I.—MEETINGS.

This society shall hold at least one session in each year, at such time and place as may be determined upon.

ARTICLE II.—ELECTION OF OFFICERS.

SECTION 1. The officers shall be elected by ballot at each annual meeting of the society, and shall enter upon their respective duties immediately after the close of the annual session.

SEC. 2. The regular chosen officers of this society shall constitute an executive committee, which shall arrange the business of the session, attend to matters of business not otherwise specially provided for, and perform such other duties as may, by vote of the society, devolve upon them.

ARTICLE III.—DUTIES OF OFFICERS.

SECTION 1. The president shall preside at the meeting of the society, and perform such duties as may, by vote of the society, be devolved upon him. He shall deliver an address at the opening of each annual session, upon such subject as he may select.

SEC. 2. The vice-presidents in their order shall perform the duties of the president in his absence or disability.

SEC. 3. The secretary shall keep a record of the proceedings of the meetings, conduct the correspondence of the society, issue notice of meetings, and notify members of their election.

SEC. 4. The treasurer shall receive all money belonging to the society, shall make all disbursements under the recommendation of the president, and shall furnish at each annual meeting a written report of the condition of the finances.

ARTICLE IV.—CENSORS.

There shall be a Board of Censors, consisting of five members, who shall receive and examine the credentials of candidates for membership, and report to the society for election such as may be found properly qualified. The members of said board shall be elected by ballot at each annual session to serve for one year from the first day of January next succeeding said election.

ARTICLE V.—MEMBERSHIP.

SECTION 1. Any regular qualified and reputable physician endorsed by two members, may be elected to membership in this society.

SEC. 2. The admission fee of each member of the society shall be two dollars.

SEC. 3. Members shall pay annually the sum of three dollars toward defraying the expenses of the society.

SEC. 4. The election of no member shall be considered completed until he shall have paid his admission fee and annual dues; and his membership can only be continued by the annual payment of these dues, and by becoming a member of the American Institute of Homœopathy before he has been a member of this society for three years. Until his dues are paid he may not participate in the active work of the society. He may at any time within three years, however, complete his membership by paying his dues for the current year, together with any back dues that may have accrued against him.

SEC. 5. Members neglecting the payment of dues for three years, after proper notification from the treasurer, shall have their names dropped from the roll of membership. Any person thus dropped shall have the prvilege of reinstatement by paying all arrearages, on recommendation of the Board of Censors.

SEC. 6. Any physician of eminent attainments in the special fields of medicine with which this society is concerned, may be elected an Honorary Member on recommendation of the Board of Censors at any annual meeting of the society, and shall be exempt from dues and shall have all the privileges of members, except voting and eligibility to office.

SEC. 7. Any foreign physician may be elected a Corresponding Member of the society at any annual meeting, on recommendation of the Board of Censors, and shall have all the privileges of members, except voting and eligibility to office.

ARTICLE VI.—RULES OF ORDER.

SECTION 1. The rules governing the deliberations of this society shall be those found in Roberts' Rules of Order.

SEC. 2. No report or paper shall be received by the society in an incomplete or unfinished condition, and the title of any proposed paper shall be forwarded to the president by April 1st of each year and the completed paper by May 1st.

SEC. 3. The time allowed for the presentation of any paper shall be twenty minutes. The leading discussion shall not exceed ten minutes, and all other discussion five minutes for each speaker.

ARTICLE VII.

These by-laws may be altered or amended by a vote of two-thirds of the members present at the annual meeting.

STANDING RESOLUTIONS.

Adopted June 19, 1899.

"*Resolved,* That the Committee on the Nomination of Officers shall consist of all the ex-presidents of the society present at any meeting, provided that in any case less than three be present the president shall appoint from the members present a number sufficient to make the committee consist of three members."

Adopted June 16, 1900.

"*Resolved,* That all papers presented before this society shall become its property and be *first* published in its official organ; and, furthermore, be it

"*Resolved,* That the Homœopathic Eye, Ear and Throat Journal be continued as the official organ of the society."

Adopted June 19, 1900.

"*Resolved,* That the president be requested to appoint at each annual meeting a committee of three members on transportation, who shall act, as far as possible, conjointly with the same committee of the Institute."

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